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

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In the Matter of	)	
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Measurement Standards for Digital Television Signals Pursuant To the Satellite Home Viewer Extension and Reauthorization Act of 2004	)	ET Docket No. 06-94
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REPORT AND ORDER

Adopted: November 22, 2010 **Released: November 23, 2010**

By the Commission:

I. INTRODUCTION

1. By this action, the Commission amends its rules to include measurement procedures for determining the strength of a digital broadcast television (DTV) signal at any specific location. These procedures will be used for determining whether households are eligible to receive distant DTV network signals retransmitted by satellite carriers, pursuant to the provisions of the Satellite Television Extension and Localism Act of 2010 (STELA).[1] This Report and Order implements DTV signal measurement procedures proposed in the Commission's *Notice of Proposed Rulemaking (SHVERA NPRM)* and *Further Notice of Proposed RuleMaking* (*STELA FNPRM*) in this proceeding with minor modifications.[2]

II. BACKGROUND

2. The STELA is the fourth in a series of statutes that addresses satellite carriage of television broadcast stations. In the 1988 Satellite Home Viewer Act ("1988 SHVA"), Congress established a statutory copyright license to enable satellite carriers to offer subscribers who could not receive the over-the-air signal of a broadcast station access to broadcast programming via satellite.[3] The

[1] *See* Satellite Television Extension and Localism Act of 2010, Title V of the "American Workers, State, and Business Relief Act of 2010," Pub. L. 111-175, 124 Stat. 1218 (2010) (STELA). The STELA reauthorizes and updates the expired Satellite Home Viewer Extension and Reauthorization Act of 2004 (SHVERA). *See* Satellite Home Viewer Extension and Reauthorization Act of 2004, Pub. L. No. 108-447, § 204, 118 Stat 2809, 3393 3423-24, (2004), codified at 47 U.S.C. §339(c)(1). The SHVERA was enacted as Title IX of the "Consolidated Appropriations Act, 2005." On December 9, 2005, as required by Section 204(b) of the SHVERA, the Commission issued a Report to Congress. *See, "Report to Congress: Study of Digital Television Field Strength Standards and Testing Procedures,"* ET Docket No. 05-182, 20 FCC Rcd. 19504 (2005) (*SHVERA Report*).

[2] *See In the Matter of Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004*, ET Docket No. 06-94, *Notice of Proposed Rulemaking,* 21 FCC Rcd. 4735 (2006) (*SHVERA NPRM*). *See also Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking*, ET Docket Nos. 10-152 and 06-94, 25 FCC Rcd. 10474 (2010) (*STELA FNPRM*).

[3] Satellite Home Viewer Act of 1988 (1988 SHVA), Pub. L. No. 100-667, 102 Stat. 3935, Title II (1988) (codified at 17 U.S.C. §§ 111, 119). The 1988 SHVA was enacted on November 16, 1988, as an amendment to the copyright laws. The 1988 SHVA gave satellite carriers a statutory copyright license to offer distant signals to "unserved" households. 17 U.S.C. § 119(a).

1988 SHVA was intended to protect the role of local broadcasters in providing over-the-air television by limiting satellite delivery of network broadcast programming to subscribers who were "unserved" by over-the-air signals.

3. The Satellite Home Viewer Improvement Act of 1999 (SHVIA) amended the Copyright Act and the Communications Act of 1934 (Communications Act) to permit use of a predictive model to determine whether a household can receive the analog television signal broadcast by a local network affiliated television station.[4] Households that are unable to receive a signal of sufficient strength are defined as "unserved households." The SHVIA did not, however, contain provisions for digital signals.

4. In December 2004, Congress enacted the Satellite Home Viewer Extension and Reauthorization Act of 2004, which again amended the Copyright Act[5] and the Communications Act[6] to further aid the competitiveness of satellite carriers and expand program offerings for satellite subscribers while protecting localism. The SHVERA included new provisions for distant digital signal reception and amended Section 339 of the Communications Act and Section 119 of the Copyright Act to provide three methods by which a subscriber can establish eligibility to receive such signals.[7] First, a subscriber would be eligible to receive the distant digital signal of a particular network if his or her household was predicted by the SHVIA ILLR model[8] to be unserved by the over-the-air analog signal of any affiliate of that network (not necessarily the local affiliate). Second, a subscriber whose household was predicted to be served by a local station's analog signal could request an on-site signal strength test to determine if his or her household is unable to receive that station's digital signal.[9] Third, a satellite subscriber could receive distant digital signals if the television network station granted a waiver to allow satellite retransmission of the relevant network from a distant station.

5. Section 204 of the SHVERA also directed the Commission to conduct an inquiry regarding whether the Commission's digital TV signal strength standards and signal measurement procedures for determining if a household is "unserved" by local signals should be revised. Section 204 of SHVERA further directed the Commission to provide Congress with a Report on its findings and recommendations for any revisions that might be necessary for implementing DTV measurement

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[4] *See* Consolidated Appropriations Act for 2000, Pub. L. 106-113, § 1000(9), 113 Stat. 1501 (enacting S. 1948, including the Satellite Home Viewer Improvement Act of 1999 (SHVIA), Title I of the Intellectual Property and Communications Omnibus Reform Act of 1999, relating to copyright licensing and carriage of broadcast signals by satellite carriers, codified in various sections of 17 and 47 U.S.C.). Section 1008(a) of SHVIA added, *inter alia,* new Section 339 ("Carriage of Distant Television Stations by Satellite Carriers") to the Communications Act of 1934, 47 § U.S.C. 151, *et seq.*

[5] Section 103 of the SHVERA created a new 17 U.S.C. § 119(a)(4)(D) to provide satellite carriers with a statutory copyright license to offer distant digital network signals.

[6] *See* 47 U.S.C. §§ 325, 338, 339 and 340.

[7] *See* 17 U.S.C. § 119(d)(10)(A) and 47 U.S.C. § 339(c)(4)(A). *See also* 47 U.S.C. § 339 (a)(2)(D)(i).

[8] The ILLR Computer Program developed as a result of the SHVIA computes the predicted over-the-air signal strength of analog television (TV) stations at individual viewing locations. *See* "The ILLR Computer Program," OET Bulletin No. 72 (2002) available at:
http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet72/oet72.pdf.

[9] *See* 47 U.S.C. § 339(a)(2)(D)(i). Generally, subscribers in the top 100 television markets were allowed to request a digital signal strength test after April 30, 2006 and subscribers in other markets were allowed to request a test after July 15, 2007. *See* 47 U.S.C. §339(a)(2)(D)(vii)(I)(aa)(bb). The Commission proposed rules for a digital signal strength measurement procedure and that procedure has been used on an interim basis pending its adoption of final rules. *See In the Matter of Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004*, ET Docket No. 06-94, *Notice of Proposed Rulemaking,* 21 FCC Rcd. 4735 (2006).

standards and procedures.[10] Pursuant to this requirement, the Commission issued a Notice of Inquiry[11] and, on December 8, 2005, issued the *SHVERA Report* to Congress that, in relevant part, stated that the Commission generally believes that the digital television measurement procedures should be similar to the Commission's current procedures for measuring the field strength of analog television stations in Section 73.686(d) of the rules, but with certain modifications to address the differences between analog and digital TV signals.[12] The Commission also stated that no changes are needed to the digital television field strength standards and/or planning factors for purposes of determining whether a household is eligible to receive retransmitted distant network television signals.[13]

6. The Commission subsequently adopted the *SHVERA NPRM* in which it proposed measurement standards for digital television signals as recommended in the *SHVERA Report*.[14] The Commission specified that it would rely on the proposed DTV measurement procedures for evaluating DTV signal strength pending the adoption of final rules.[15] These interim procedures have been in effect since adoption of the *SHVERA NPRM* in April, 2006, and to date we have not received any reports of problems or difficulties with their use. The Commission received four comments and three reply comments from parties representing the interests of satellite service providers, broadcast television stations, radio engineering firms and consumer electronics manufacturers in response to the *SHVERA NPRM*.[16]

7. The STELA retains the SHVERA framework of three methods for establishing subscriber eligibility to receive distant digital signals: predictive model; on-site testing; and waiver. Following the STELA's enactment, the Commission adopted the *STELA FNPRM* to address provisions of the STELA regarding the second method, digital signal measurement procedures. The Commission explained in the *STELA FNPRM* that the STELA raised three new issues not addressed in the *SHVERA NPRM*: 1) which station signals are to be measured; 2) what type of antenna is to be used in performing on-location testing; and 3) which program stream from a station in the local market is to be measured.[17] We sought comment on these issues and more generally to refresh the record in response to the *SHVERA NPRM*. We note that Congress directed that "[i]n conducting such rulemaking, the Commission shall seek ways to minimize consumer burdens associated with on-location testing."[18] The Commission received three comments and

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[10] *See* 47 U.S.C. § 339(c)(1).

[11] *See In the Matter Of Technical Standards For Determining Eligibility For Satellite-Delivered Network Signals Pursuant To The Satellite Home Viewer Extension and Reauthorization Act,* ET Docket No. 05-182, *Notice of Inquiry*, 20 FCC Rcd. 9349 (2005) (*SHVERA Inquiry*).

[12] *Id.* at 19506.

[13] *See SHVERA Report*, 20 FCC Rcd at 19506, 19553-19561. The digital television noise-limited service contour thresholds are signal levels of -41 dBμ, -36 dBμ, and -28 dBμ for UHF channels, high VHF channels, and low VHF channels, respectively. *See* 47 C.F.R. § 73.622(e).

[14] *See SHVERA NPRM, supra* n. 2.

[15] *Id.* at ¶ 6.

[16] A list of commenters is provided in Appendix C.

[17] *See* 17 U.S.C. § 119(d)(10)(A) as amended by STELA section 102. The STELA specifies that network affiliates broadcast on multicast streams will be considered "on or after the qualifying date," which is defined as "October 1, 2010, for multicast streams that exist on March 31, 2010; and January 1, 2011, for all other multicast streams." 17 U.S.C. § 119(d)(13), as amended by STELA section 102. *See also* 17 U.S.C. § 119(d)(10)(A), (d)(14) and (15), as amended by STELA section 102.

[18] We also note that the STELA requires that the Commission "issue an order completing its rulemaking proceeding in ET Docket No. 06-94 ..." by November 24, 2010. *See* STELA, section 204(b)(2), amending section 339(c)(3)(B) of the Communications Act, codified at 47 U.S.C. 339(c)(3)(B).

three reply comments in response to the *STELA FNPRM* from parties representing the interests of satellite service providers, broadcast television stations and radio engineering firms.[19]

III. DISCUSSION

8. In accordance with the provisions of the STELA, we are amending our rules to include procedures for measuring the field strength of digital television signals. These procedures will be used to determine whether a household is eligible to receive a distant digital network signal from a satellite television provider. The rules adopted herein were developed based on our recommendations in the *SHVERA Report*[20] and comments received in response to the *SHVERA NPRM* and the *STELA FNPRM*. They largely rely on existing, proven methods the Commission has already established for measuring analog television signal strength at any individual location, as set forth in Section 73.686(d) of the existing rules, but include modifications as necessary to accommodate the inherent differences between analog and digital TV signals. The new digital signal measurement procedures include provisions for the location of the measurement antenna, antenna height, signal measurement method, antenna orientation and polarization, and data recording.

9. *Stations to be Tested.* We adopt our proposal that measurements for distant network signal eligibility only include stations located within the same DMA as the satellite subscriber's household. The STELA differs from the SHVIA and SHVERA in that it specifies that only "local" stations, *i.e.*, stations located within the same DMA as the subscriber's household, are to be considered in determining a subscriber's eligibility. Under the SHVIA, Congress defined an "unserved household," with respect to a particular television network, to mean "a household that-- cannot receive ... an over-the-air signal of a primary network station affiliated with that network ..."[21] This definition was not altered in the SHVERA. However, in the STELA, Congress modified the definition of an "unserved household" to mean a household that "cannot receive ... an over-the-air signal containing the primary stream, or ... the multicast stream, originating in that household's *local market* and affiliated with that network ..."[22] Under the rules for analog TV measurements, a testing entity had to measure the signals of all stations affiliated with a specific network. However, under the STELA, a testing entity is to consider only the signals of those network-affiliated stations that are located in the same DMA as the satellite subscriber. Thus, we proposed in the *STELA FNPRM* to modify our proposed rules for measurement of DTV signals for purposes of determining eligibility for delivery of distant network signals by satellite providers to incorporate this change. We did not receive any comment on this issue and accordingly adopt our proposals without change. We note that, consistent with Section 204(b)(2) of the STELA, this rule change could reduce burdens on both testers and consumers as fewer stations would need to be tested, potentially resulting in lower costs for consumers and saving time.

10. *Indoor Measurements.* We adopt our proposal to continue to rely on an outdoor signal intensity test for purposes of determining subscriber eligibility to receive distant network signals. The current measurement rules for analog signals specify the use of an outdoor antenna, consistent with the provisions of the SHVERA.[23] The STELA modified the statute's wording to replace the term

[19] A list of commenters is provided in Appendix C.

[20] *See* n. *1*, *supra*.

[21] *See* n. 4, *supra*. Implementing 17 U.S.C. § 119(d)(10)(A).

[22] *See* 17 U.S.C. § 119(b)(1)(A) as amended by STELA section 102 (emphasis added).

[23] *See* 47 C.F.R. § 73.686(d). We note that this rule section does not specifically use the term "outdoor antenna." However, its various provisions, such as the requirement to elevate the antenna to 6.1 meters above ground for a one story building and 9.1 meters above ground for a two-story or taller building, can only be followed using an outdoor antenna. The SHVERA refers to this rule section in putting forth the requirements for testing. *See* section 204 of the SHVERA which created a new 47 U.S.C. § 339(a).

"conventional, stationary, outdoor rooftop receiving antenna" with the term "antenna."[24] In light of the amended statutory language, we invited comment on the potential use of moveable indoor antennas in our digital signal measurement procedures, but for several reasons declined to propose rules for indoor measurements. First, in the *SHVERA Report,* the Commission concluded that many factors, including the performance expected of an indoor antenna, the placement of the antenna, and the location within a structure or room where the antenna is located make it difficult to develop an indoor television signal measurement procedure that will provide accurate, reliable and repeatable results.[25] There are no standard models or planning factors for indoor reception, and in particular there is no standard antenna specification for such reception.[26] The wide variation in indoor viewing situations makes it difficult to specify a standard model that meaningfully relates to any typical indoor viewing location. In addition, the performance of indoor antennas available to consumers varies significantly.[27] Second, signal strengths typically vary significantly at different locations within a room and in different rooms such that it is not apparent where the measurement antenna should be placed.[28] In light of these considerations, we requested comments in the *STELA FNPRM* on alternative approaches for making eligibility determinations in situations where consumers are not able to use an outdoor antenna to receive local television signals. We also noted that the signal intensity standard in Section 73.622(e)(1), which specifies the signal level that constitutes service, assumes an outdoor antenna, as it relies on the methodology of the Commission's OET Bulletin No. 69, which in turn relies on the DTV planning factors, including an outdoor antenna.[29]

11. In response to the *SHVERA NPRM,* EchoStar (subsequently renamed Dish Network) filed comments requesting that the Commission permit indoor testing for purposes of determining distant signal eligibility.[30] Similarly, Dish Network, along with DirecTV, filed comments in response to the *STELA FNPRM* requesting that an indoor test procedure be implemented.[31] They argue that because the STELA deleted the specification of a "conventional, stationary, outdoor rooftop receiving antenna" from the definition of an "unserved household," a household should now be deemed unserved if it cannot receive a signal of sufficient strength by means of a simple indoor antenna.[32] They contend that Congress' intent was to imply that indoor antennas should be included in a measurement procedure. Opposing this view, the Broadcaster Associations (Broadcasters) argue that the fact that the descriptive phrase "outdoor antenna" was dropped from the STELA was not a signal that Congress intended to

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[24] *See* 17 U.S.C. § 119(d)(10)(A), as amended by STELA Section 102.

[25] *See* SHVERA Report at ¶ 125.

[26] *Id.* Discussing that EchoStar, the main proponent of measuring using an indoor antenna, states that a typical antenna should be used but does not provide any information defining such an antenna. The outdoor DTV antenna planning factors include antenna gain of 4 dBd, 6 dBd, and 10 dBd for Low VHF, High VHF, and UHF, respectively, downlead line loss of 1 dB, 2 dB, and 4 dB for Low VHF, High VHF, and UHF, respectively, antenna height of 10 meters, and front-to-back ratios of 10 dB, 12 dB, and 14 dB for Low VHF, High VHF, and UHF, respectively. *See* OET Bulletin No. 69, "Longley-Rice Methodology for Evaluating TV Coverage and Interference," February 06, 2004.

[27] *Id. at* ¶¶ 38-9.

[28] *Id. at* ¶¶ 37, 43 and 125.

[29] *See* FCC "OET Bulletin No. 69, Longley-Rice Methodology for Evaluating TV Coverage and Interference," February 06," (OET Bulletin No. 69 is available on the FCC website at http://www.fcc.gov/oet/info/documents/bulletins/)

[30] EchoStar comments to the *SHVERA NPRM* at 15.

[31] DirecTV and Dish Network comments to *STELA FNRPM* at 4.

[32] *Id.* at 2.

abandon the longstanding "outdoor antenna" provision.[33] Further, they claim that Congress, by specifying use of the signal strength standard in Part 73 essentially dictated the use of an outdoor antenna because the standard is based on an outdoor antenna.

12. We are not persuaded by DirectTV and Dish Network's arguments that Congress' deletion of the qualifiers specifying a "conventional, stationary, outdoor rooftop receiving antenna" from the definition of an "unserved household" in the STELA reflects a Congressional intent that indoor signal strength measurements be incorporated into the Commission's rules. We are also not persuaded by the Broadcasters' assertion that the STELA requires the Commission to continue to rely on an outdoor antenna for conducting measurements. Instead, we believe that the change in statutory language simply affords that Commission latitude to consider all types of antennas. As observed in the *SHVERA Report*, the Commission has always assumed that households will use the type of antenna that they need to achieve service; if an indoor antenna is insufficient for a particular household, it will generally rely on a rooftop antenna.[34] Nothing in the STELA reflects that Congress wished to alter that assumption. On the contrary, the STELA specifies use of the digital television signal strength standard in Section 73.622(e)(1) of the rules, which is derived from the assumptions in the digital television planning factors set forth in OET Bulletin No. 69, including the assumption of use of an outdoor antenna.[35] We do not believe that Congress would have incorporated this assumption into the STELA if it intended use of an indoor antenna standard.

13. We also find that continued use of an outdoor antenna standard for signal strength measurements is the best means of achieving the directives for digital TV signal strength measurements set forth in the STELA. First, as discussed above, the STELA specifies use of the digital television signal strength standard in Section 73.622(e)(1) of the rules as the threshold metric against which to compare measurements to determine whether households are "served" or "unserved." That signal strength standard is important because it serves to define the service boundary or "service contour" of a digital television station and the threshold at which a station's service is considered to be available in areas within that service contour. That standard, in turn, is premised on use of an outdoor antenna through the digital television planning factors set forth in OET Bulletin No. 69. To provide for meaningful comparisons between that standard and digital TV signal strength measurements, we find that it is appropriate to specify use of an outdoor antenna, so that the signals whose strengths are being measured have the same qualities as the signal specified in the standard.

14. Second, no reliable indoor testing method has been proposed. DirecTV and Dish Network submitted a test protocol for indoor antennas developed by Mr. Christopher Kurby which they claim addresses the Commission's concerns in the *STELA NPRM*.[36] Mr. Kurby recommends that the Commission allow for the use of dipole antennas with gains as characterized by the Institute for Telecommunications Sciences for low VHF, VHF, and UHF of -4.4, -2.8, -3.0 dBd, respectively.[37] Mr. Kurby also recommends that the measurement location be the room in which the TV is intended to be

[33] Broadcaster comments to the *STELA FNPRM* at 5-6.

[34] Broadcasters comments to the *STELA FNPRM* at 5. They quote the following response on DIRECTV's website to the frequently asked question "Can I Use My Current Antenna to Get a Distant Signal?": "In general, as you move further from the transmitter location a broadcast signal becomes weaker. . . . Because indoor units are less likely to have a clear line-of-sight, homes that depend on Rabbit Ear antennas may find it more difficult to receive digital signals. Some locations may need to switch to a roof mounted antenna in order to receive an acceptable digital signal." (DIRECTV website http://support.directv.com/app/answers/detail/a_id/2621 (visited Sept. 1, 2010) (emphasis added).)

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

[36] DirecTV and Dish Network comments to *STELA FNRPM* at 21.

[37] *Id.* at Engineering Analysis and Statement at 6.

used. He argues that the antenna height above the floor is almost completely irrelevant because according to the COST231 model,[38] signal level versus height is linear with distance in dB.[39] Thus, Mr. Kurby states that any height within a room will not affect the measurement substantially. His recommended procedure also would orient the antenna in the direction of the first station to be measured and maintain that position for all other stations to be tested.[40] His procedure also provides for adjustments on the order of 37.3 dB which should be added to the measured indoor value to provide the signal level to be compared to the standard in Section 73.622(e)(1) of the rules.[41] DirecTV and Dish Network also argue that the time variability should be corrected for 99% rather than the 50% currently used.[42]

15. In opposition, the Broadcasters submitted an Engineering Statement prepared by Meintel Sgrignoli & Wallace (MSW). The Engineering Statement avers that it would be difficult to define an indoor measurement procedure that could accurately account for the wide variety of antennas, possible antenna locations (rooms), antenna orientations, and the dynamic signal conditions within a home. It further states that MSW is not aware of any efforts to characterize a "median" case for all of these factors, nor to develop a "typical" antenna performance characteristic.[43] More specifically, MSW states that the testing model suggested by DirecTV and Dish Network is flawed. Its support for this statement includes lack of specification of which TV in a household should be tested, which can lead to manipulation of the system; lack of an antenna calibration requirement, which could lead to unreliable results; impractical antenna choice due to a dipole measuring almost nine feet for low VHF signals; a belief that a 1 meter antenna height does not work for all situations; and that the antenna would not be properly pointed for each station, thereby unfairly penalizing all stations other than the first to be measured.[44]

16. We agree with the Broadcasters that the proposed methodology advanced by DirecTV and Dish Network is flawed. We stated previously that a measurement procedure must be accurate and repeatable if it is to have any validity as a basis for determining eligibility for distant network signals.[45]

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[38] European Co-operation in the field of Scientific and Technical research (COST) Action 231 developed the COST 231 propagation model for estimating urban transmission loss in the 900 MHz and 1800 MHz bands. *See, e.g.,* K. Loew, "Comparison of urban propagation models with CW measurements," in *Proc. Veh. Technol. Conf.,* Denver, CO, 1992, pp. 936–942.

[39] *Id.* Mr. Kurby states that there is only a 1 dB difference between a 10 foot antenna height and 13 foot antenna height, *i.e.,* 10log(13) – 10log(10) = 1.1.

[40] *Id.*

[41] *Id.* at 6-7. Mr. Kurby's adjustments to the measured value include 9 dB for the difference between the gain of an outdoor and indoor antenna, 20 dB to account for difference in indoor and outdoor reception, and 7.7 dB to account for the difference between the 9 meter height of an outdoor antenna and a 1 meter indoor antenna. (He also recommends additional adjustments for antenna mismatch, reduced sensitivity in low cost set-top boxes, multipath, and a change to 99% reception availability that would increase the correction factor to 64 dB.)

[42] DirecTV and Dish Network comments to *STELA FNRPM* at 24. In the case of analog TV service, the planning factors include adjustments to the time variability factors in order to provide for service at 50% of locations 90% of the time. Those values add 6 dB at low VHF, 5 dB at high VHF, and 4 dB at UHF to the F(50,90) contour values to define the analog F(50,50) Grade B contour values. See Robert A. O'Connor, "Understanding Television's Grade A and Grade B Service Contours," IEEE Trans. Broadcasting, Vol. BC14, No. 4, December 1968, for more information.

[43] Broadcaster comments to the *STELA FNPRM* at MSW Engineering Statement at 9.

[44] Broadcasters reply comments to *STELA FNRPM* at 39-40.

[45] The notion that the test procedure should be accurate and objective originates from the first proceeding the Commission conducted to develop TV measurement standards. *See* In the Matter of Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act, *Report and Order,* CS Docket No. 98-201, 14 FCC Rcd. 2654, 76 (1999) ¶45 (*SHVA Report and Order*) ("[f]or the SHVA to function more effectively, (continued....)

To achieve this goal, the methodology involved must be sufficiently specific so that if different testers were to make the measurement, their results would be consistent. We find that the proposed testing procedure submitted by DirecTV and Dish Network would not achieve such results. First, as pointed out by the Broadcasters, there is a lack of specificity regarding which TV should be measured in a household with multiple TVs. For example, measured signal strength near a TV located in a basement will be different (generally much lower) than measured signal strength near a TV located on the first or second floors. Thus, under the proposed indoor testing procedure measurements are likely to have inconsistent results, with the signal strength standard being met in some rooms and not in others. Second, the proposed testing procedure fails to specify where to place the measurement antenna within a room. Just as measured signal strength is likely to be different in different rooms, placing a measurement antenna in different locations within a room often leads to different measured signal strength values. Experience with the digital TV transition showed that antenna placement within a room could make a significant difference in whether channels could be received,[46] due to the dynamic nature of the indoor environment, where multipath effects are pronounced. In this regard, we also observe that the Commission advised consumers of wide antenna performance variability generally and for indoor antennas in particular.[47] For example, the Commission advised consumers having problems with indoor antennas to check the antenna performance information, move the antenna for best reception, place it near a window, as high as possible, away from electronic equipment and change the direction the antenna is facing. Further, the Commission advised that a roof-top antenna may be needed. Thus, the lack of specificity in DirecTV and Dish Network's procedures is likely to lead to inconsistent results that are difficult to repeat and easy to manipulate. Testers could intentionally place an antenna in a location known to have poor reception, move TVs into rooms with known reception issues, place objects or persons at certain locations within a house or a room, or use a test antenna at locations where it is impossible to actually place a TV antenna. Contrary to DirecTV and Dish Network's assertion that the height of the measurement antenna does not make much difference, real-world experience shows otherwise. For these reasons, the indoor testing protocol proposed by DirecTV and DISH fails to meet our well-established criteria for an accurate and repeatable digital signal measurement procedure.

17. As a fallback and as a way to account for multipath effects, DirecTV and Dish Network suggest that the Commission should permit a "reception" test which would examine whether a household can lock on to a viewable signal, no matter how strong it is. They claim that not only does the signal need to be of sufficient strength, but the household must be also able to receive the signal; only if it receives a signal in the first place does the strength of the signal become relevant. This can be accomplished by simply testing reception, *i.e.*, does the TV receiver show a picture.[48] The Broadcasters assert that the Commission should reject what they characterize as a "picture test" proposal by DirecTV and DISH, arguing that the STELA contemplates a signal strength test, not a picture quality test, as many factors, such as the type and location of the indoor antenna and the presence and location of other electronic devices in the home that may generate radio noise, may affect the ability of a particular TV to receive a picture, all of which have nothing to do with a station's signal strength.[49] Moreover, they state that a picture test would be unreliable for various reasons: the receiver may be broken or malfunctioning; the TV could be in bad repair; the TV could be analog without a digital converter; or a wire could be cut

(Continued from previous page)
a relatively low cost, accurate, and reproducible methodology for measuring the presence of a Grade B intensity signal at an individual household is especially important.").

[46] *See, e.g.*, Broadcasters reply comments to the *STELA FNPRM*, engineering statement at 13-14.

[47] *See* for example, "Fix Reception Problems" at http://www.dtv.gov/fixreception.html and "FCC Consumer Facts: Antennas and Digital Television" at http://www.fcc.gov/cgb/consumerfacts/dtvantennas.html

[48] DirecTV and Dish Network comments to *STELA FNRPM* at 24.

[49] Broadcasters reply comments to *STELA FNRPM* at 38-39.

somewhere.[50] We agree with the Broadcasters that the "reception" test proposed by DirecTV and Dish Network is neither consistent with the STELA nor accurate and repeatable. The statute expressly states that the purpose of the test is to verify "the subscriber's inability to receive a signal of the signal intensity ..." referenced in § 73.622(e)(1) the Commission's rules.[51] This statutory language explicitly refers to an objective test of signal intensity, not the specific TV receiving system in a viewer's household. Finally, we note DirecTV and Dish Network's proposal would render the statutory language superfluous because if the intent was simply to test if a viewer's receiving system can display a picture, then there would have been no need for Congress to specify a separate signal intensity test as all that would be necessary is to turn on the TV and observe the results. For these reasons, we reject DirecTV and Dish Network's proposal for a reception test.

18. DirecTV and Dish Network also argue in support of indoor testing that in the *Report and Order* implementing the 1988 SHVA, the Commission suggested that in some instances "the measurement should be taken inside, near the television."[52] Their reliance is misplaced. The Commission suggested such a measurement only in specific, extraordinary circumstances: households that are part of a multi-dwelling unit (MDU) that is taller than three stories without access to a master antenna on the roof or a balcony or patio.[53] Moreover, the *SHVA Report and Order* specified that tests should be taken outdoors, consistent with the 1988 SHVA,[54] and the rules codified by the Commission in the *SHVA Report and Order* only provided for outdoor tests.

19. We also reject DirecTV and Dish Network's proposed adjustments to the signal strength standard to account for differences between indoor and outdoor measurements.[55] We find that application of these adjustments would significantly alter the digital television service description as defined in the Section 73.622(e)(1) signal strength standard by reducing the likelihood that measurements at a given location would indicate a capability to receive service. Under the proposed plan, at least 37.3 dB would be subtracted from an outdoor measurement to estimate the predicted indoor signal strength. No additional modifications to the model or its assumptions are offered to compensate for this proposed change which in essence would modify the signal strength standard, creating a separate standard for locations with and without outdoor antennas.[56]. Such a change could, as the broadcasters observe, dramatically increase the number of households eligible for satellite delivery of distant network signals. Notwithstanding the difficulties already pointed out in developing a standard that would provide accurate and reliable indoor measurements,[57] we are concerned that many satellite subscribers who could use an outdoor antenna would have an incentive to take the "easy path" and simply report that they cannot use an

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[50] *Id.* at 38.

[51] *See* STELA, section 204(b)(2), amending section 339(c)(3)(B) of the Communications Act, codified at 47 U.S.C. 339(c)(3)(B).

[52] DirecTV and Dish Network comments to *STELA FNRPM* at 21. *See also* SHVA Report and Order at para. 15.

[53] *Id.*

[54] This decision was upheld on reconsideration, in which the Commission specifically rejected Echostar's argument that the outdoor procedure should be changed to provide for indoor measurements at the TV set. *See* In the Matter of Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act, *Order on Reconsideration,* CS Docket No. 98-201, 14 FCC Rcd. 2654 (1999) ¶14.

[55] Comments of DirecTV and Dish Network to *STELA FNPRM* at Engineering Analysis and Statement at 6-7. *See also,* n. 41, *supra* for details on the proposed adjustments.

[56] That is, under this proposal, assuming a UHF TV signal which requires a -41 dBμV/m signal, a test at a location without an outdoor antenna would need to result in measured signal strength of at least -3.7 dBμV/m to account for the 37.3 dB in adjustments (*e.g.,* -41 dBμV/m – -37.3 dB = -3.7 dBμV/m).

[57] *See* para. 10, *supra.*

outdoor antenna and thereby be evaluated under this proposed indoor antenna standard, when in fact they could readily receive a station's service with outdoor antenna. For example, subscribers located within a station's service area but at distances from its transmitter where indoor reception is not possible could simply assert that they cannot use an outdoor antenna and under this proposal be eligible to receive a distant network signal. This would remove large numbers of viewers from local stations' potential audience. In view of Congress' selection of the Section 73.622(e)(2) signal strength standard as the threshold for distant signal eligibility in the STELA, we do not believe that Congress envisioned or contemplated such an increase in the numbers of satellite subscribers eligible for delivery of distant network signals.

20. Finally, we note that outdoor testing may be less burdensome to consumers because it eliminates the potential for property damage that might be associated with conducting a test indoors..[58] The Broadcasters claim that indoor testing would increase burdens because consumers would need to be home to let testers in, whereas an outdoor test can be done anytime and does not require allowing a stranger into the home, where there would be a risk of property damage due to accidents from indoor movement of large antennas that must be used as dipoles for low VHF channels and that can measure almost 9 feet across.[59] We agree but acknowledge the likelihood that a consumer who has requested a test would want to attend the conduct of the test whether indoors or outside.

21. Notwithstanding this decision, we remain aware and concerned that using the outdoor measurement procedures may result in instances where a consumer who either cannot use an outdoor antenna or cannot receive service using an outdoor antenna[60] and is not able to receive a station's service with an indoor antenna will be found ineligible for satellite delivery of a distant network signal. We considered ways to design an outdoor measurement that could be used to determine the availability of a signal that would provide sufficient signal strength to be received by a hypothetical indoor antenna.[61] However, the record does not provide sufficient data to determine the appropriate antenna gain and pattern of such an antenna. Further, the record does not provide sufficient data to determine what signal strength should be used, how to correlate an outdoor measurement to indoor viewing locations[62] or how to determine the circumstances under which the hypothetical indoor signal strength should be used. Moreover, as discussed above, any reliance on an indoor standard would be at odds with both the signal strength rule in STELA and the signal strength adopted for the new digital predictive model pursuant to STELA.[63]

22. Our concern for consumers is mitigated to a large extent by new local-into-local offerings by satellite carriers, which we believe will significantly reduce the number of instances where satellite subscribers would need to consider requesting delivery of distant network signals. Dish Network now

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[58] *See* STELA, section 204(b)(2), amending section 339(c)(3)(B) of the Communications Act, codified at 47 U.S.C. 339(c)(3)(B) (discussing the reduction of consumer burden in association with signal testing).

[59] Broadcasters reply comments to *STELA FNRPM* at 41.

[60] For example, a satellite subscriber may only have the option of placing an antenna on the south side of a building along with the satellite dish and be unable to receive over-the-air reception from television stations broadcasting from the north.

[61] The Commission does not have any data nor are we aware of any data that characterizes the broad distribution of antennas that viewers are actually using.

[62] For example, signal attenuation will differ depending on home construction materials. Applying such a procedure could entail a large scale test effort to characterize the attenuation properties of various building materials and a requirement for the tester to determine the materials present in any given test in order to apply the proper correction factor.

[63] *See supra,* paragraphs 17 and 19; and *STELA ILLR Report and Order* at paragraphs ___ .

provides local network stations (local-into-local service) in all 210 DMAs.[64] In addition, DirecTV now provides local-into-local service in all but 40 relatively small markets.[65] We recognize that DirecTV and Dish Network will still have some subscribers who are not within the spot beams providing local-into-local service and who, therefore, would like to qualify for distant signals. However, the locations in which local-into-local service is not available are likely to be in areas with relatively small populations at the edge of DMAs that are served by satellite service "spot beams" that provide localized service to the major portion of a DMA, including its center of population. Those populations are served by their carrier's larger regional coverage signals that do not have the local signals carried on the spot beams. In concluding that the outdoor antenna standard remains appropriate, we have also considered that most subscribers for whom local-into-local service is unavailable, and who will request distant signals from their satellite carriers, are likely to be in rural areas where use of outdoor antennas is more common and practical than in urban areas. As noted above, Dish now serves all 210 DMAs and only a small number of Dish subscribers are beyond the spot beams serving those DMAs and therefore potentially eligible for distant signals.[66] Although DIRECTV does not offer local stations in 60 DMAs, these are small market, mostly rural areas where outdoor antennas are likely to be more prevalent.

23. We also observe that under Section 339(a)(2)(E) of the Communications Act, satellite TV subscribers who are denied delivery of a distant network signal based on a measurement[67] may request a waiver, through the subscriber's satellite carrier, from the station that asserts that such retransmission is prohibited.[68] While we do not know the extent to which stations have granted such waivers, we note that the waiver process is available. We encourage stations receiving such waiver requests to consider the

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[64] *See* 17 U.S.C. § 119(g), as amended by STELA section 105 and 47 U.S.C. § 342, as amended by STELA section 206. Dish Network launched 29 markets on June 3, 2010, and now offers local-into-local service in all 210 DMAs. *See DISH Network L.L.C. Application for Qualified Carrier Certification*, MB Docket No. 10-124, Attachment A at ¶ 2 (filed June 30, 2010). *See also* http://dish.client.shareholder.com/releasedetail.cfm?ReleaseID=474211. DIRECTV currently provides the local-into-local package in 150 DMAs, comprising 94% of U.S. households. *See* http://www.directv.com/DTVAPP/packProg/localChannels.jsp?assetId=900018.

[65] *See* http://www.directv.com/DTVAPP/content/hd/hd_locals (noting that DIRECTV currently offers local broadcast channels in 170 markets, representing more than 97% of U.S. TV households) (site visited Nov. 22, 2010).

[66] *See*, Application for Qualified Carrier Certification of DISH Network, LLC (MB Docket No. 10-124, filed June 30, 2010) ("DISH Application"), at Attachment A (Affidavit of David Shull). they are required to provide service to at least 90% of households in every DMA in order to retain their qualified carrier status, and they have retained their status, so it would not be unreasonable to assumer they are in fact serving at least that many customers. The STELA requires that DISH maintain actual local-into-local service in all 210 DMAs (codified at 17 USC 119(g)(4)(A)(i)), and defines local-into-local service, in part, as serving at least 90% of households in a DMA (17 USC 119(g)(7)(B)). In the 29 new markets being served by DISH, its signals are predicted to serve at least 90% of households, *see* DISH Application at Attachment D (DMA Specific Information and Maps). *See also* footnote 37, *supra*.

[67] We note that a measurement is only performed at the request of a subscriber if the predictive model, first, determines that a subscriber is predicted to receive service at his or her location.

[68] *See* 47 U.S.C. 339(a)(2)(E). This section of the Communications Act provides that "[T]his paragraph shall not prohibit retransmission of a distant signal of any distant network station to any subscriber to whom the signal of the local network station affiliated with the same network is available, if and to the extent that such local network stations has affirmatively granted a waiver from the requirements of this paragraph to such satellite carrier with respect to retransmission of such distant network station to such subscriber." Similar waiver authority is provided in Section 119(a)(13) of the Copyright Act, 17 U.S.C. 119(a)(13). That section of the Copyright Act provides that "[a] subscriber who is denied the secondary transmission of a signal of a network station under subsection (a)(2)(B) may request a waiver from such denial by submitting a request, through the subscriber's satellite carrier, to the network station asserting that the secondary transmission is prohibited. The network station shall accept or reject a subscriber's request for a waiver within 30 days after receipt of the request. If a television network station fails to accept or reject a subscriber's request for a waiver within the 30-day period after receipt of the request, that station shall be deemed to agree to the waiver request and have filed such written waiver."

mitigating circumstances such as whether the subscriber is in an urban area or resides in a multiple dwelling unit, thereby confined to rely on an indoor antenna, and act accordingly to grant the waiver request on a case-by-case basis.

24. *Multicast Signals*. We adopt our tentative conclusion not to make any special provisions for multicast signals in our modified digital signal strength measurement procedures. Our tentative conclusion in the *STELA FNPRM* was based on the recognition that the testing protocol measures a station's signal at the subscriber location and that all program streams are equally available on a signal.[69] Whether the station's signal includes one or more program streams or networks does not necessitate a change in the test employed because the presence of multiple streams has no bearing on the signal intensity or receivability, *i.e.*, the bit stream of a single TV signal can be decoded into multiple program streams, but there is only a single TV signal to measure. We stated our belief that the tester, the satellite carrier and the network affiliate involved in the conduct of the test will be able to identify the network affiliates in the broadcast signal. If the signal is found to be available at the subscriber location at the requisite intensity, then any and all of the networks in that signal will likewise be available. If the station's signal is not found to be present at the requisite intensity, the subscriber will be unserved with respect to any and all networks broadcast on the streams in that signal, unless the subscriber receives a signal of sufficient strength from another local station affiliated with the same network or networks. Only the Broadcasters commented on our tentative proposal, stating that multicast streams should be treated equally.[70] Accordingly, we adopt our tentative conclusion not to make any special provisions for multicast signals.

25. *DTV Signal Measurement Procedures*. We adopt the proposal in the *SHVERA NPRM* to continue using the same rules for measuring DTV signals as the Commission uses for measuring analog TV signals, with the modifications identified below. Under the current rules, measurements are to be made as close as possible to the specific site where the household's receiving antenna is located or in the case when there is no receiving antenna at the site, measurements are to be made at locations as close as possible to a reasonable and likely spot for the antenna.[71] Further, the current rules require that five cluster measurements be taken, each at least 3 meters apart, and if possible, the first testing point should be the center of a square whose corners are the four other locations.[72] EchoStar commented that these requirements make good sense and provide a fair degree of flexibility to the tester to adapt to the subscriber's location.[73] However, EchoStar asked for clarification that it is not necessary to choose locations in the shape of a square, but only that the testing locations be as close as possible to the likely antenna site.[74] Similarly DirecTV and Dish Network argue in response to the STELA NPRM that the current cluster measurement is needlessly involved.[75] As an alternative, they state that the locations should be in an area encompassed by a square, circle, or semicircle, as possible, with 3 meter separation and with one measurement in the center representing the nominal television receive location.[76] No other parties commented on this issue. We clarify that the existing rule provides that measurements should be made in the form of a square "if possible," but does not require that the square pattern be used. Testers have always had the flexibility to adjust the measurement locations in order to conduct them in a safe and

[69] *See STELA FNPRM* at para. 38.

[70] Broadcaster comments to the *STELA FNPRM* at 13.

[71] *See* rule 73.686(e)(ii) in Appendix A, *infra*.

[72] *See* 47 C.F.R. § 73.686(d)(1)(ii).

[73] EchoStar comments to the *SHVERA NPRM* at 13.

[74] *Id.* at 14.

[75] DirecTV and Dish Network comments to the *STELA FNPRM* at 22.

[76] *Id.*

economically feasible manner while still obtaining the most accurate measurements possible. Thus, we do not believe any additional clarification or change on this issue is necessary. We also adopt our proposal that measurements of DTV signals be taken by elevating the antenna to 6.1 meters (20 feet) above the ground for one story buildings and to 9.1 meters (30 feet) above the ground for structures taller than one story. Again, this procedure is identical to the current rules for analog TV signal measurements and is consistent with the DTV planning factors.[77] EchoStar, arguing that this height requirement may lead to lengthy tests as the antenna has to be raised, lowered and reset repeatedly, asks that the Commission allow measurements to be made at a lower height and then corrected to reflect the signal strength at 20 or 30 feet. It suggests that such a change may increase the pool of qualified testers who have the necessary equipment to conduct signal strength tests.[78] In opposition, the Broadcasters assert that the rationale underlying the Commission's height rules--to simulate the roof-top antenna mount of a 20 foot one-story house, or a 30 foot tall two-story house--applies equally to digital and analog signals.[79] We agree with the Broadcasters. This rule was devised as a way to account for most households in the country while maintaining an easy-to-administer standard, and we are not persuaded that we should modify it now.[80] Further, no evidence was presented showing that a reduction in the required antenna height requirement would significantly increase the pool of available testers.

26. In their comments in response to the *STELA FNPRM*, DirecTV and Dish Network also argue that antenna height is irrelevant to signal strength measurements since the signal level versus height is linear with distance in dB above the ground level according to COST231.[81] The Broadcasters disagree, arguing that results obtained from the COST231 model are not relevant to the broadcasting environment as that model was developed for the land mobile, cellular and satellite industries which have different frequency bands, use cases, signal characteristics, and usage statistics.[82] We reject the satellite carriers' arguments. For the reasons cited by the Broadcasters, we do not believe that we can rely on the COST 231 model to provide insight regarding how TV signals may vary with antenna height indoors. The COST231 model was developed to predict propagation for land mobile systems operating between 500 MHz and 2000 MHz.[83] The broadcasting propagation environment differs greatly from the land mobile propagation environment. DirecTV and Dish Network did not provide any information showing that results from the COST231 model are relevant to modeling broadcast transmissions. Therefore, as our existing rule has worked well in the past for analog TV measurements and is consistent with the DTV planning factors, we find that it is also appropriate for DTV measurement and will adopt it as proposed.

27. For the actual measurement of signal strengths, the Commission proposed that the tests measure the integrated average power over the signal's entire 6 megahertz bandwidth, and that the intermediate frequency (i.f.) bandwidth of the measuring instrumentation be no greater than 6 megahertz.[84] This proposal would conform the measurement method to the format of the DTV signal.

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[77] *See* 47 C.F.R. 73.686(d)(3)(iii) and OET Bulletin 69.

[78] EchoStar comments to the *SHVERA NPRM*, Engineering Analysis and Statement at 17.

[79] Joint Comments were filed by the National Association of Broadcasters, the ABC Television Affiliates Association, CBS Television Network Affiliates Association, NBC Television Affiliates, and the Association for Maximum Service Television (Broadcasters). *See* Broadcasters comments to the *SHVERA NPRM* at 4.

[80] *See* SHVA Report and Order at para. 58.

[81] EchoStar comments to the *STELA FNPRM* at 24 and at Engineering Analysis and Statement at 6.

[82] Broadcasters reply comments to the *STELA FNPRM* at engineering statement at 6.

[83] European Co-operation in the field of Scientific and Technical research (COST) Action 231 developed the COST 231 propagation model for estimating urban transmission loss in the 900 MHz and 1800 MHz bands. *See, e.g.*, K. Loew, "Comparison of urban propagation models with CW measurements," in *Proc. Veh. Technol. Conf.*, Denver, CO, 1992, pp. 936–942.

[84] *See SHVERA NPRM* at. para. 10.

Because the DTV signal format is different from the analog TV signal format, this part of the new rules would be different from the current analog signal measurement procedure. Commenters unanimously agreed with our proposal to measure total integrated power over the 6 megahertz bandwidth. However, the Broadcasters seek more specificity regarding the restriction of the i.f. bandwidth. They state that a large i.f. bandwidth, such as 6 megahertz, could produce inaccurate results due to "spillage" into the desired channel from an adjacent channel and recommend that the Commission require an i.f. bandwidth of less than 100 kHz.[85] EchoStar favors flexibility in this portion of the rules to prevent a reduction of the pool of qualified testers with necessary equipment.[86] We recognize the Broadcasters' concern that a tester using an i.f. bandwidth of 6 megahertz could pick up additional energy in adjacent channels. However, we do not believe this is a significant concern as most measurements could not be taken using a 6 megahertz i.f. bandwidth because such a setting is not available on most measurement instruments. While we believe most instruments are capable of i.f. bandwidth settings of 100 kHz or less, some may not have this capability, which could potentially reduce the number of parties that have the equipment needed to perform these measurements. Further, measurement instruments with an i.f. bandwidth greater than 100 kHz can yield accurate results if used properly. No matter what rules we may adopt, digital signal strength measurements require a degree of technical competence and sound engineering judgment. Accordingly, to provide flexibility while still ensuring testing accuracy, the rules we are adopting recommend that the measurement instrumentation use an intermediate frequency i.f. bandwidth of 100 kilohertz unless the instrumentation is specifically designed to use an alternative i.f. bandwidth. Additionally, the rules continue to require testers to use good engineering practice, including proper choice and use of instrumentation to ensure accurate results.

28. We also adopt our remaining proposals regarding measurement procedure: to use a shielded transmission line; to match the antenna impedance to the transmission line at all frequencies measured; to employ a suitable balun[87] when an unbalanced line is used; to measure transmission line loss for each frequency; to use a horizontally polarized antenna; and to orient the testing antenna so that its maximum gain (over an isotropic antenna) faces the strongest signal coming from the transmitter being tested.[88] All of these procedures are identical to those currently used for analog TV measurement. No parties commented on these proposals. We continue to believe that these procedures are appropriate for measurement for digital television signals and thus, we adopt them as proposed.

29. *Measurement Antenna.* We are adopting rules to provide testers flexibility to choose either a half-wave dipole or a gain antenna when conducting DTV measurements. In the *SHVERA NPRM,* the Commission proposed to allow use of either type of antenna for testing the signal strength of DTV signals.[89] In making this proposal, the Commission recognized that both of these types of antennas are permitted for analog TV signal measurements.[90] Under this regime, the on-site tester will have flexibility to determine the best antenna to employ when conducting field strength measurements.

[85] Broadcasters comments to the *SHVERA NPRM*, engineering statement at 8.

[86] EchoStar comments to the *SHVERA NPRM* at 17.

[87] A balun is a device that joins a balanced line to an unbalanced line. It serves to isolate a transmission line and provides a connection between the joined lines in order to achieve compatibility between the balanced and unbalanced lines

[88] *See SHVERA NPRM* at ¶ 12.

[89] *Id.* at ¶ 8.

[90] *See* 47 C.F.R. § 73.686(d)(1)(i).

30. The Broadcasters argue that only a calibrated gain antenna should be used in testing for digital TV signal strength.[91] They argue that in contrast to a dipole antenna, a gain antenna offers discrimination against unwanted signals (such as multipath or interference from other television signals)[92] and generally delivers a stronger signal to the measuring equipment, and therefore permits use of a wider variety of measurement equipment than would a dipole antenna.[93] The Broadcasters also assert that because dipole antenna length must be adjusted for each different channel being measured,[94] it would be simpler to use a gain antenna which does not need such adjustments.[95] In contrast, EchoStar supports the use of both dipole and gain antennas for measuring DTV signal strength. Notwithstanding the Broadcasters' arguments, EchoStar, supported by the engineering firm of Hammett & Edison (H&E), comments that a dipole antenna is adequate for measuring DTV signal strength.[96] H&E states that it has conducted numerous DTV field strength surveys using both dipole and gain antennas with equal success when measuring UHF channels.[97] In its reply comments, EchoStar adds that the need for adjustments to dipoles for different channels can be eliminated by using broadband dipoles that can cover a large frequency range without the need for retuning or other adjustments.[98] Also arguing against the required use of a calibrated gain antenna, the engineering firm of Cohen, Dippell and Everist, P.C. (CDE) points out that the half-wave dipole has been a standard reference antenna for field measurements in the VHF and UHF bands in accordance with the Commission's rules since the inception of television.[99]

31. We reject the Broadcasters' arguments against use of dipole antennas. Half-wave dipole antennas and gain antennas each have various advantages and disadvantages. For accuracy, half-wave dipole antennas generally must be retuned for each frequency when making measurements. However, half-wave dipole antennas can be calibrated easily and reliably. Gain antennas do not require retuning and can boost the signal in the direction they are pointed while reducing interfering signals from other directions. On the other hand, gain antennas can be a little more difficult to calibrate precisely and maintain in calibration. We continue to believe that both half-wave dipole and gain antennas will provide reliable, accurate test results, so long as the tester is diligent and takes care to ensure that good engineering practice is followed, as required by our rules. Both types of antennas are permitted for testing analog signals and we will similarly permit both for measuring digital signals. Thus, each tester, based on experience, availability of equipment, and local conditions, will be permitted to decide which antenna would be best for measuring digital TV signals.

32. *Weather.* We adopt our proposal to prohibit digital television signal strength measurements being made during inclement weather.[100] Inclement weather can generally be defined as

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[91] Broadcasters comments to the *SHVERA NPRM* at 2; *see also* Broadcasters comments to the *STELA FNPRM,* engineering statement at 8.

[92] Broadcasters comments to the *SHVERA NPRM*, engineering statement at 3.

[93] *Id.* at 2.

[94] Because measurements must be taken at multiple locations for each TV station being measured, Broadcasters state that a tester using a dipole antenna has the choice of adjusting the dipole for each station at each location before moving to the next, or measuring at each location, adjusting the dipole, and then moving through each location again until all measurements have been taken.

[95] Broadcasters comments to the *SHVERA NPRM,* engineering statement at 5. Use of a tunable dipole antenna requires precise adjustment of the length of the antenna elements for each channel measured at the testing location.

[96] EchoStar comments to the *SHVERA NPRM* at 4.

[97] EchoStar reply comments to the *SHVERA NPRM,* engineering statement at 2.

[98] EchoStar reply comments to the *SHVERA NPRM* at 8.

[99] Cohen, Dippell and Everist, P.C. ("CDE") reply comments to the *SHVERA NPRM* at 2-3.

[100] *See SHVERA NPRM* at 14.

unfavorable atmospheric conditions such as, but not limited to heavy rainfall, snowfall accumulation, high windspeed, or any combination thereof. As the Commission noted in making this proposal, while in general weather conditions do not have an appreciable effect on the reception of broadcast television signals, heavy precipitation and the movement of major weather fronts through the measurement area could impact the signal strength measurements.[101] No commenter objected to this proposal and we adopt it as proposed.

33. *Data Recording*. We adopt our proposal to apply the same recording requirements for DTV signal strength measurements as are used for analog measurements.[102] In general, the existing rules require that the recorded data contain a list of calibrated equipment along with a description of the calibration, a description of the environment, such as topography, vegetation, buildings, etc., as well as the location and value of the actual measurements. There were no objections to this proposal and we adopt the rules in this regard as proposed.

34. *Other Matters*. EchoStar observes that the Commission's rules define the digital television service area as the noise-limited contour based on criteria that the specified signal level is predicted to be exceeded at 50% of the locations, 90% of the time (using F(50,90) curves and the Longley-Rice terrain prediction model). EchoStar proposes that the time variability factor be adjusted from 90% to 50% (*i.e.* to the F(50, 50) level) for comparison to a median measured value.[103] Similarly, DirecTV and Dish Network state that the Commission should either develop a conversion factor or use a standard method such as Rayleigh, which describes an increase in necessary power from the mean to 99% of 20dB.[104] The comments do not state how this conversion would be used, but we presume it would be intended as a correction factor to reduce the measured signal strength value. We note that we rejected this same request in the *SHVERA Report*[105] and that EchoStar has not provided any new information regarding this issue. Accordingly, we will not make any adjustments to the signal strength standard.[106]

35. Finally, in the *SHVERA NPRM*, we asked if there are steps the Commission can take in this proceeding that will facilitate or enhance tester competence and availability. We did not receive any suggestions on this issue. As noted above, we have provided flexibility for the conduct of DTV measurement tests, such as the rules requiring good engineering practice, which provides for testers to use antennas and measurement instrumentation with which they are familiar to endure accurate results. We believe that by bestowing this flexibility to testers, we will maximize the number of qualified testers available.[107]

III. PROCEDURAL MATTERS

36. *Final Regulatory Flexibility Analysis*. As required by the Regulatory Flexibility Act, *see* 5 U.S.C. § 603, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) of the possible economic impact on small entities of the policies and rules addressed in this Report and Order. The FRFA is set forth in Appendix B.

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[101] *Id.*

[102] *Id.* at 15.

[103] EchoStar comments to the *SHVERA NPRM,* engineering statement at 2.

[104] DirecTV and Dish Network comments to *STELA FNRPM* at Engineering Analysis and Statement at 7.

[105] *See SHVERA Report, supra* n. 1, at ¶ 128.

[106] The companion *STELA Report and Order* similarly rejects changing from using F(50, 90) values for digital television. *See STELA ILLR Report and Order* at para. 41.

[107] *See* paras. 9, 13, and 20, *supra*. *See also,* para. 27, *supra.* which minimizes burdens on testers by providing flexibility through use of best engineering practices.

37. *Final Paperwork Reduction Act of 1995 Analysis.* This document contains new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we previously sought specific comment on how the Commission might "further reduce the information collection burden for small business concerns with fewer than 25 employees." In this present document, we have assessed the effects of our requirement that testers adhere to the data recording requirements of Section 73.686(e)(3) and described in paragraph 16, *supra*, and find that these requirements will not impose burdens to businesses with fewer than 25 employees as we are adopting the identical data recording requirements that have been used for analog TV measurements for many years.

IV. ORDERING CLAUSES

38. Accordingly, IT IS ORDERED, pursuant to Sections 4(i), 4(j), 303 and 339 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 154(j), 303 and 339, and Section 204 of the Satellite Home Viewer Extension and Reauthorization Act of 2004, codified at 47 U.S.C. § 339(a)(2)(D)(vi), that this Report and Order is HEREBY ADOPTED and that Section 73.686 of the Commissions rules, 47 C.F.R. § 73.686, IS AMENDED as set forth in Appendix A of this Report and Order. The rules adopted in this Report and Order contain information collection requirements subject to the Paperwork Reduction Act of 1995, Public Law 104-13, that are not effective until approved by the Office of Management and Budget. The Federal Communications Commission will publish a document in the Federal Register announcing OMB approval and the effective date of the rules adopted herein.

39. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to the Government Accountability Office pursuant to the Congressional Review Act, see 5 U.S.C. 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch

Marlene H. Dortch
Secretary

APPENDIX A

Final Rules

PART 73 - RADIO BROADCAST SERVICES

1. The authority citation for Part 73 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303, 334 and 336, unless otherwise noted.

2. Section 73.686 is amended by revising the first sentence of paragraph (d) and by adding a new paragraph (e) to read as follows:

§ 73.686 Field strength measurements.

* * * * *

(d) *NTSC - Collection of field strength data to determine NTSC television signal intensity at an individual location--cluster measurements*—

* * *

(e) *DTV - Collection of field strength data to determine digital television signal intensity at an individual location--cluster measurements*—(1) Preparation for measurements-- (i) Testing antenna. The test antenna shall be either a standard half-wave dipole tuned to the center frequency of the channel being tested or a gain antenna provided its antenna factor for the channel(s) under test has been determined. Use the antenna factor supplied by the antenna manufacturer as determined on an antenna range.

(ii) *Testing locations* - At the test site, choose a minimum of five locations as close as possible to the specific site where the site's receiving antenna is located. If there is no receiving antenna at the site, choose a minimum of five locations as close as possible to a reasonable and likely spot for the antenna. The locations shall be at least three meters apart, enough so that the testing is practical. If possible, the first testing point should be chosen as the center point of a square whose corners are the four other locations. Calculate the median of the five measurements (in units of dBμ) and report it as the measurement.

(iii) *Multiple signals* - (A) If more than one signal is being measured (*i.e.*, signals from different transmitters), use the same locations to measure each signal.

(B) For establishing eligibility of a satellite subscriber to receive distant network signals, only stations affiliated with the network in question that are located in the same Nielsen Designated Market Area (DMA) as the test site may be considered and tested.

(2) *Measurement procedure.* Measurements shall be made in accordance with good engineering practice and in accordance with this section of this chapter. At each measuring location, the following procedure shall be employed:

(i) *Testing equipment.* Perform an on-site calibration of the test instrument in accordance with the manufacturer's specifications. Tune a calibrated instrument to the center of the channel being tested. Measure the integrated average power over the full 6 megahertz bandwidth of the television signal. The intermediate frequency of the instrument should be set to 100 kilohertz unless the instrument is specifically designed by the manufacturer to use an alternative i.f. setting. The instrument must be capable of integrating over the selected i.f. for the 6 megahertz channel bandwidth. Take all measurements with a horizontally polarized antenna. Use a shielded transmission line between the testing antenna and the field strength meter. Match the antenna impedance to the transmission line at

all frequencies measured, and, if using an un-balanced line, employ a suitable balun. Take account of the transmission line loss for each frequency being measured.

(ii) *Weather.* Do not take measurements during periods of inclement weather, including, but not limited to, periods of heavy rainfall, snowfall accumulation, high windspeed, or any combination thereof.

(iii) *Antenna elevation.* When field strength is being measured for a one-story building, elevate the testing antenna to 6.1 meters (20 feet) above the ground. In situations where the field strength is being measured for a building taller than one-story, elevate the testing antenna 9.1 meters (30 feet) above the ground.

(iv) *Antenna orientation.* Orient the testing antenna in the direction which maximizes the value of field strength for the signal being measured. If more than one station's signal is being measured, orient the testing antenna separately for each station.

(3) Written record shall be made and shall include at least the following:

(i) A list of calibrated equipment used in the field strength survey, which for each instrument specifies the manufacturer, type, serial number and rated accuracy, and the date of the most recent calibration by the manufacturer or by a laboratory. Include complete details of any instrument not of standard manufacture.

(ii) A detailed description of the calibration of the measuring equipment, including field strength meters, measuring antenna, and connecting cable.

(iii) For each spot at the measuring site, all factors which may affect the recorded field, such as topography, height and types of vegetation, buildings, obstacles, weather, and other local features.

(iv) A description of where the cluster measurements were made.

(v) Time and date of the measurements and signature of the person making the measurements.

(vi) For each channel being measured, a list of the measured value of field strength (in units of dBμ after adjustment for line loss and antenna factor) of the five readings made during the cluster measurement process, with the median value highlighted.

APPENDIX B

Final Regulatory Flexibility Act Analysis

As required by the Regulatory Flexibility Act of 1980, as amended ("RFA")[1] an Initial Regulatory Flexibility Analysis ("IRFA") was incorporated in the *Notice of Proposed Rulemaking* ("*NPRM*") to this proceeding.[2] The Commission sought written public comment on the proposals in the NPRM, including comment on the IRFA. The Commission received no comments on the IRFA. This present Final Regulatory Flexibility Analysis ("FRFA") conforms to the RFA.[3]

A. Need for and Objectives of the Report and Order. This Report and Order ("R&O") adopts rules to implement procedures for determining the strength of a digital broadcast television (DTV) signal at any specific location. These rules implement our recommendations for DTV measurement procedures presented in the Commission's *Report to Congress* (*SHVERA Report*) pursuant to Section 204(b) of the Satellite Home Viewer Extension and Reauthorization Act of 2004 (SHVERA).[4] The rules provide procedures to determine whether households are eligible to receive distant DTV network signals retransmitted by satellite communications providers. In December 2004, Congress enacted the Satellite Home Viewer Extension and Reauthorization Act of 2004,[5] pursuant to which, the Commission conducted an *Inquiry*[6] (*SHVERA Inquiry*) and on December 9, 2005, released the *SHVERA Report*. In relevant part, the *SHVERA Report* stated that the Commission intended to conduct a rulemaking proceeding to specify procedures for measuring the field strength of digital television signals at individual locations.[7] The Report also stated that the digital television measurement procedures should be similar to the current procedures for measuring the field strength of analog television stations in Section 73.686(d) of the rules, but with certain modifications to address the differences between analog and digital TV signals.[8]

Wherever possible, the adopted digital signal strength measurement procedures rely on the existing, proven methods the Commission has established for measuring analog television signal strength at any individual location.[9] We also note that the SHVERA statute provided that testing of digital signal strength for this purpose could have begun as early as April 30, 2006.[10]

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

[2] *Implementation of the Satellite Home Viewer Extension and Reauthorization Act of 2004*, 20 FCC Rcd 2983, Appendix C (2005) ("*NPRM*").

[3] *See* 5 U.S.C. § 604.

[4] *See SHVERA Report, supra* n.1.

[5] *See id.*

[6] *See In the Matter Of Technical Standards For Determining Eligibility For Satellite-Delivered Network Signals Pursuant To The Satellite Home Viewer Extension and Reauthorization Act,* ET Docket No. 05-182, *Notice of Inquiry*, 20 FCC Rcd. 9349 (2005). (*SHVERA Inquiry*)

[7] *See SHVERA Report, supra* note 4..

[8] *Id.*

[9] *See generally,* 47 C.F.R. § 73.686(d).

[10] 47 U.S.C. § 339(a)(2)(D)(vii) provides trigger dates for testing. Generally, subscribers in the top 100 television markets will be able to request a digital signal strength test after April 30, 2006 and subscribers in other markets will (continued....)

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA. There were no comments filed that specifically addressed the rules and policies proposed in the IRFA.

C. Description and Estimates of the Number of Small Entities to Which the Rules Adopted in this Notice may apply. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that will be affected by the proposed rules.[11] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[12] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[13] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[14]

The rules adopted in this Report and Order modify previous proposals to measure the strength of digital television signals at any particular location, as a means of determining whether any particular household is "unserved" by a local DTV network station and is therefore eligible to receive a distant DTV network signal retransmitted by a Direct Broadcast Satellite (DBS) service provider. Therefore, DBS providers will be directly and primarily affected by the proposed rules, if adopted. In addition, rules adopted will also directly affect those local digital television stations that broadcast network programming. Therefore, in this FRFA, we consider, and invite comment on, the impact of the proposed rules on small digital television broadcast stations, small DBS providers, and other small entities. A description of such small entities, as well as an estimate of the number of such small entities, is provided below.

(Continued from previous page)
be able to request a test after July 15, 2007. Only network stations that have received a tentative digital channel designation that is the same as such stations' current digital channel, or that have lost interference protection, are subject to the April 30, 2006 commencement date for signal strength testing. Network stations in the top 100 markets without tentative channel designations on their DTV channels, as well as all network stations not in the top 100 markets, will be subject to signal strength testing beginning July 15, 2007, unless the Commission grants the station a waiver. 47 U.S.C. § 339(a)(2)(D)(vii)(I)(aa)(bb).

Waiver requests by stations subject to the testing commencement date of April 30, 2006 were required to be submitted by November 30 2005. To be grantable, waiver requests must provide "clear and convincing evidence that the station's digital signal coverage is limited due to the unremediable presence of one or more of the following: 1) the need for international coordination or approvals; 2) clear zoning or environmental legal impediments; 3) force majeure; 4) the station experiences a substantial decrease in its digital signal coverage area due to the necessity of using a side-mounted antenna; 5) substantial technical problems that result in a station experiencing a substantial decrease in its coverage area solely due to actions to avoid interference with emergency response providers; or 6) no satellite carrier is providing the retransmission of the analog signals of local network stations under section 338 in the local market." The Act further provides that "under no circumstances may such a waiver be based upon financial exigency." Waiver requests by stations subject to the testing commencement date of July 15, 2007 had to be submitted to the Commission no later than February 15, 2007. *See* Public Notice DA No. 05-2979 (rel. Nov. 17, 2005). *See generally,* 47 U.S.C. § 339(a)(2)(D)(vii)-(viii).

[11] 5 U.S.C. §§ 603(b) (3), 604(a) (3).

[12] *Id.*, § 601(6).

[13] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such terms which are appropriate to the activities of the agency and publishes such definitions(s) in the Federal Register."

[14] 15 U.S.C. § 632.

Nationwide, there are a total of approximately 29.6 million small businesses, according to the SBA.[15] A "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[16] Nationwide, as of 2002, there were approximately 1.6 million small organizations.[17] The term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[18] Census Bureau data for 2002 indicate that there were 87,525 local governmental jurisdictions in the United States.[19] We estimate that, of this total, 84,377 entities were "small governmental jurisdictions."[20] Thus, we estimate that most governmental jurisdictions are small.

Cable Television Distribution Services. The "Cable and Other Program Distribution" census category includes cable systems operators, closed circuit television services, direct broadcast satellite services, multipoint distribution systems, satellite master antenna systems, and subscription television services. Since 2007, these services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: "This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services; wired (cable) audio and video programming distribution; and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry." The SBA has developed a small business size standard for this category, which is: All such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services the Commission must, however, use current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard; that size standard was: All such firms having $13.5 million or less in annual receipts. According to Census Bureau data for 2002, there were a total of 1,191 firms in this previous category that operated for the entire year. Of this total, 1,087 firms had annual receipts of under $10 million, and 43 firms had receipts of $10 million or more but less than $25 million. Thus, the majority of these firms can be considered small.

Direct Broadcast Satellite (DBS) Service. DBS service is a nationally distributed subscription service that delivers video and audio programming via satellite to a small parabolic "dish" antenna at the subscriber's location. Because DBS provides subscription services, DBS falls within the SBA-recognized definition of Wired Telecommunications Carriers. However, as discussed above, the Commission relies on the previous size standard, Cable and Other Subscription Programming, which provides that a small entity is one with $13.5 million or less in annual receipts. Currently, only two operators—DirecTV and EchoStar Communications Corporation (EchoStar)—hold licenses to provide DBS service, which requires a great investment of capital for operation. Both currently offer subscription services and report

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[15] *See* SBA, Office of Advocacy, "Frequently Asked Questions," http://web.sba.gov/faqs/faqindex.cfm?areaID=24 (revised Sept. 2009).

[16] 5 U.S.C. § 601(4).

[17] Independent Sector, The New Nonprofit Almanac & Desk Reference (2002).

[18] 5 U.S.C. § 601(5).

[19] U.S. Census Bureau, Statistical Abstract of the United States: 2006, Section 8, page 272, Table 415.

[20] We assume that the villages, school districts, and special districts are small, and total 48,558. *See* U.S. Census Bureau, Statistical Abstract of the United States: 2006, section 8, page 273, Table 417. For 2002, Census Bureau data indicate that the total number of county, municipal, and township governments nationwide was 38,967, of which 35,819 were small. *Id.*

annual revenues that are in excess of the threshold for a small business. Because DBS service requires significant capital, the Commission believes it is unlikely that a small entity as defined by the SBA would have the financial wherewithal to become a DBS licensee. Nevertheless, given the absence of specific data on this point, the Commission acknowledges the possibility that there are entrants in this field that may not yet have generated $13.5 million in annual receipts, and therefore may be categorized as a small business, if independently owned and operated.

Television Broadcasting. The rules and policies apply to television broadcast licensees and potential licensees of television service. The SBA defines a television broadcast station as a small business if such station has no more than $14 million in annual receipts.[21] Business concerns included in this industry are those "primarily engaged in broadcasting images together with sound."[22] The Commission has estimated the number of licensed commercial television stations to be 1,392.[23] According to Commission staff review of the BIA/Kelsey, MAPro Television Database ("BIA") as of April 7, 2010, about 1,015 of an estimated 1,380 commercial television stations[24] (or about 74 percent) have revenues of $14 million or less and thus qualify as small entities under the SBA definition. The Commission has estimated the number of licensed non-commercial educational (NCE) television stations to be 390.[25] We note, however, that, in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations[26] must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. The Commission does not compile and otherwise does not have access to information on the revenue of NCE stations that would permit it to determine how many such stations would qualify as small entities.

In addition, an element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimates of small businesses to which rules may apply do not exclude any television station from the definition of a small business on this basis and are therefore over-inclusive to that extent. Also as noted, an additional element of the definition of "small business" is that the entity must be independently owned and operated. We note that it is difficult at times to assess these criteria in the context of media entities and our estimates of small businesses to which they apply may be over-inclusive to this extent.

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[21] *See* 13 C.F.R. § 121.201, NAICS Code 515120.

[22] *Id.* This category description continues, "These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public. These establishments also produce or transmit visual programming to affiliated broadcast television stations, which in turn broadcast the programs to the public on a predetermined schedule. Programming may originate in their own studios, from an affiliated network, or from external sources." Separate census categories pertain to businesses primarily engaged in producing programming. *See* Motion Picture and Video Production, NAICS code 512110; Motion Picture and Video Distribution, NAICS Code 512120; Teleproduction and Other Post-Production Services, NAICS Code 512191; and Other Motion Picture and Video Industries, NAICS Code 512199.

[23] *See* News Release, "Broadcast Station Totals as of December 31, 2009," 2010 WL 676084 (F.C.C.)(dated Feb. 26, 2010) ("*Broadcast Station Totals*"); also available at http://www.fcc.gov/mb/.

[24] We recognize that this total differs slightly from that contained in *Broadcast Station Totals*, *supra* note 446; however, we are using BIA's estimate for purposes of this revenue comparison.

[25] *See Broadcast Station Totals*, *supra* note 239.

[26] "[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has the power to control both." 13 C.F.R. § 121.103(a)(1).

Class A TV, LPTV, and TV translator stations. The rules and policies adopted in this Report and Order include licensees of Class A TV stations, low power television (LPTV) stations, and TV translator stations, as well as potential licensees in these television services. The same SBA definition that applies to television broadcast licensees would apply to these stations. The SBA defines a television broadcast station as a small business if such station has no more than $14 million in annual receipts.[27] Currently, there are approximately 537 licensed Class A stations, 2,386 licensed LPTV stations, and 4,359 licensed TV translators.[28] Given the nature of these services, we will presume that all of these licensees qualify as small entities under the SBA definition. We note, however, that under the SBA's definition, revenue of affiliates that are not LPTV stations should be aggregated with the LPTV station revenues in determining whether a concern is small. Our estimate may thus overstate the number of small entities since the revenue figure on which it is based does not include or aggregate revenues from non-LPTV affiliated companies. We do not have data on revenues of TV translator or TV booster stations, but virtually all of these entities are also likely to have revenues of less than $14 million and thus may be categorized as small, except to the extent that revenues of affiliated non-translator or booster entities should be considered.

D. Description of Projected Reporting, Recordkeeping and Other Compliance Requirements. The rules in this *Report & Order* establish procedures for measuring digital television signal strength at any specific location. These measurement procedures will be used as a means of determining whether households are eligible to receive distant DTV network signals retransmitted by DBS providers. These procedures are similar to the ones used for measuring analog television signal strength for like purposes, with only those revisions necessary to account for the difference between digital and analog signals. Section 339(a)(2)(D)(vi) of the Communications Act (47 U.S.C. § 339(a)(2)(D)(vi)) delineates when measurements are necessary and when the satellite communications provider, the digital television broadcast station, or the consumer is responsible for bearing their cost. No reporting requirement is proposed. We sought but did not receive comment on the types of burdens direct broadcast satellite service providers and digital television broadcast stations may face in complying with the proposed requirements. Entities, especially small businesses and, more generally, small entities are encouraged to quantify the costs and benefits of the proposed reporting requirements.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[29]

Since the adoption of analog television signal strength procedures in 1999, the number of analog TV signal strength measurements taken in order to determine household eligibility to receive distant analog TV network signals has been infrequent. For example, DIRECTV, in comments filed in ET Docket No. 05-182, Notice of Inquiry on Technical Standards for Determining Eligibility for Satellite-Delivered Network Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act, 20 FCC Rcd 9349 (2005), stated that in the last five years only 1400 DIRECTV subscribers received onsite tests to determine eligibility to receive distant network television signals. In that proceeding, both DIRECTV and EchoStar indicated that they generally declined to perform or arrange for a test and instead refused to offer distant signals when subscribers were predicted to be "served" and the relevant network stations refused to grant a waiver.

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[27] *See* 13 C.F.R. § 121.201, NAICS Code 515120.

[28] *See Broadcast Station Totals, supra* note 239.

[29] *See* 5 U.S.C. § 603(c).

As TV stations transition from analog transmissions to DTV, we anticipate that the combined number of analog and digital measurements will not increase substantially. This is because, as part of the DTV transition, television stations will be ceasing the transmission of analog signals and households seeking to receive retransmitted DTV network signals will not be seeking to receive analog signals. In other words, digital measurements will replace analog measurements. Also, as direct broadcast stations increasingly offer local-to-local service to households pursuant to SHVERA, those households will not be eligible to receive retransmitted distant signals and therefore DTV signal strength measurements for this purpose will not be necessary.

Finally, the Report & Order will allow measurements to be taken using either a standard half-wave dipole antenna or a gain antenna with a known antenna factor for the channel(s) that are to be tested For digital measurements, this approach would allow the tester flexibility in performing the test while still providing for accurate results. The Report & Order does not require the use of a gain antenna only. Commenters provided information regarding differences in ease of use of gain antennas as compared to the use of half-wave dipole antennas. We received comment on what rules we should propose, if any, that would address the apparent lack of qualified, independent testers to perform signal strength tests. Commenters indicated that there is no feasible regulatory solution to increasing the number of qualified testers available. No alternative methods that would reduce the cost of performing a test while retaining or improving on the accuracy of the proposed method was submitted.

Report to Congress: The Commission will send a copy of the Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.[30] In addition, the Commission will send a copy of the Report and Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register

[30] *See* 5 U.S.C. § 801(a)(1)(A).

APPENDIX C

List of Commenters and Reply Commenters to the Notice of Proposed Rule Making

A. Comments

1) Broadcasters (National Association of Broadcasters, ABC Television Affiliates Association, CBS Television Network Affiliates Association, and NBC Television Affiliates, Association for Maximum Service Television,)
2) Consumer Electronics Association
3) DIRECTV Inc.
4) EchoStar Satellite L.L.C.

B. Reply Comments

1) Broadcasters (NAB/ABC, CBS and NBC affiliate Associations/MSTV)
2) Cohen, Dippell and Everist, P.C.
3) EchoStar Satellite L.L.C.

List of Commenters and Reply Commenters to the Further Notice of Proposed Rule Making

A. Comments

1) Adaptrum Inc.
2) Broadcaster Associations (National Association Of Broadcasters, ABC Television Affiliates Association, CBS Television Network Affiliates Association, FBC Television Affiliates Association, NBC Television Affiliates, Association for Maximum Service Television)
3) DIRECTV, Inc. and DISH Network L.L.C.

B. Reply Comments

1) Broadcaster Associations (National Association Of Broadcasters, ABC Television Affiliates Association, CBS Television Network Affiliates Association, FBC Television Affiliates Association, NBC Television Affiliates, Association for Maximum Service Television)
2) DIRECTV, Inc. and DISH Network L.L.C.
3) Named State Broadcast Associations (Alabama Broadcasters Association, Alaska Broadcasters Association, Arizona Broadcasters Association, Arkansas Broadcasters Association, California Broadcasters Association, Colorado Broadcasters Association, Connecticut Broadcasters Association, Florida Association of Broadcasters, Idaho State Broadcasters Association, Illinois Broadcasters Association, Indiana Broadcasters Association, Iowa Broadcasters Association, Kansas Association of Broadcasters, Kentucky Broadcasters Association, Louisiana Association of Broadcasters, Maine Association of Broadcasters, MD/DC/DE Broadcasters Association, Massachusetts Broadcasters Association, Michigan Association of Broadcasters, Minnesota Broadcasters Association, Mississippi Association of Broadcasters, Missouri Broadcasters Association, Nebraska Broadcasters Association, Nevada Broadcasters Association, New Hampshire Association of Broadcasters, New Jersey Broadcasters Association, New Mexico Broadcasters Association, The New York State Broadcasters

Association, Inc., North Carolina Association of Broadcasters, North Dakota Broadcasters Association, Ohio Association of Broadcasters, Oklahoma Association of Broadcasters, Oregon Association of Broadcasters, Pennsylvania Association of Broadcasters, Rhode Island Broadcasters Association, South Carolina Broadcasters Association, South Dakota Broadcasters Association, Tennessee Association of Broadcasters, Texas Association of Broadcasters, Utah Broadcasters Association, Vermont Association of Broadcasters, Virginia Association of Broadcasters, Washington State Association of Broadcasters, West Virginia Broadcasters Association, Wisconsin Broadcasters Association, and Wyoming Association of Broadcasters)