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

In the Matter of	)	
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UltraVision Security Systems, Inc. Request for Interpretation and Waiver of Section 15.511(a) & (b) of the Commission's Rules for Ultra-Wideband Devices	)	ET Docket No. 06-195

ORDER

Adopted: November 19, 2008 **Released: November 20, 2008**

By the Commission:

I. INTRODUCTION

1. By this action, we grant in part and deny in part a request submitted by UltraVision Security Systems, Inc. (UltraVision) for a waiver of the rules to allow limited marketing of its UltraSensor ultra-wideband (UWB) surveillance systems.[1] UltraVision requests that we waive the provisions for permitted operating frequency range and permitted users in Sections 15.511(a) and (b) of the rules to allow it to market up to 350 installations of the UltraSensor system over a two year period.[2] We are waiving these rules to permit the UltraSensor surveillance system to operate in the 80-600 MHz frequency band and to allow UltraVision to market the systems to any entity eligible for licensing under Part 90 of the rules.[3] We are also imposing specific operational and technical conditions on the UltraSensor systems to ensure that authorized spectrum users are protected from harmful interference, including maintaining the requirement that operators of these surveillance systems comply with the Commission's coordination requirement for ultra-wideband devices in Section 15.511(b)(2).[4] We are denying UltraVision's request to maintain a list of installations in lieu of complying with these coordination requirements. We find that a grant of this request, as conditioned herein, is in the public interest in that it will permit the operation of systems capable of providing protection from undesired intrusions to secured facilities, without increasing the risk of harmful interference to authorized services.

II. BACKGROUND

2. On February 14, 2002, the Commission adopted regulations to permit the operation of UWB transmitters.[5] Several categories of UWB devices are permitted to be operated under the Part 15

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[1] UltraVision Request for Interpretation and Waiver (Request), ET Docket 06-195 (filed October 6, 2006).

[2] 47 C.F.R. § 15.511(a) & (b). Section 15.511(a) requires the bandwidth of a UWB surveillance system to be contained between 1990 and 10,600 MHz. Section 15.511(b) limits the sale and operation of UWB surveillance systems to law enforcement, fire or emergency rescue organizations or manufacturing, petroleum or power licensees as defined in Section 90.7 of the Commission's rules. 47 C.F.R. § 90.7.

[3] 47 C.F.R. §15.511(b)(1).

[4] 47 C.F.R. §15.511(b)(2). *See also* 47 C.F.R. §15.525.

[5] *See First Report and Order* ("*1st R&O*") in ET Docket No. 98-153, *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, 17 FCC Rcd 7435 (2002); *Erratum* in ET Docket No. 98-

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regulations without a requirement for an individual license: imaging systems,[6] vehicular radars, and indoor and outdoor communication systems. UWB devices are not allocated spectrum but rather use frequency bands allocated to various authorized radio services, including Federal Government services, on a sufferance basis.[7]

3. Incumbent services using frequencies below 960 MHz include fixed and mobile, broadcasting, aeronautical radionavigation, aeronautical mobile, space operation, meteorological satellite, space research, mobile satellite, amateur and amateur satellite, radionavigation satellite, land mobile, maritime mobile, radiolocation, standard frequency and time signal-satellite, meteorological aids (radiosonde), meteorological satellite, earth exploration satellite, and radio astronomy.[8] There are aeronautical radionavigation systems operating in the restricted frequency bands in the 80 to 600 MHz frequency range that are used for communication between the pilot and the air traffic controller and navigation during precision and non-precision approaches. The aeronautical radionavigation systems include: Very High Frequency (VHF) Omni-directional Ranging system (108-118 MHz), Instrument Landing System (108-111.95 MHz and 329.3-335 MHz), VHF communication systems (118.1-137 MHz), VHF Digital Link system (118-137 MHz), and the Local Area Augmentation System VHF Data Broadcast system (108-118 MHz). In addition to the aeronautical radionavigation systems, the National Oceanic and Atmospheric Administration operates polar orbiting and geostationary satellites that carry Search and Rescue Satellite (SARSAT) payloads providing distress alert and location information to appropriate public safety rescue authorities for maritime, aviation, and land users in distress. The distress signal is transmitted by a low-powered Emergency Locator Transmitter (ELT) or the maritime equivalent Emergency Position Indicating Radio Beacon (EPIRB) operating in the 406 - 406.1 MHz band. The EPIRB/ELT signal is detected by the receiver on the spacecraft and data is transmitted back to a Local User Terminal.

4. Below 960 MHz, the unlicensed operation of a UWB transmitter is subject to the general emissions limits of Section 15.209 of the rules.[9] At the present time, only UWB ground penetrating radars (GPR) and certain UWB wall and through-wall imaging devices are allowed to have their fundamental emissions on frequencies below 960 MHz. The rules do not allow operation of fixed UWB surveillance systems below 960 MHz. Section 15.511(a) of the rules specifies technical and operational standards for fixed UWB surveillance systems to operate in the frequency range 1990-10,600 MHz.[10] Further, the operational rules of Section 15.511(b) for UWB surveillance systems limit sales to, and

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153, 17 FCC Rcd 10505 (2002); *Memorandum Opinion and Order and Further Notice of Proposed Rule Making* in ET Docket No. 98-153, 18 FCC Rcd 3857 (2003); and *Second Report and Order and Second Memorandum Opinion and Order* ("*2nd R&O*") in ET Docket No. 98-153, 19 FCC Rcd 24558 (2004). *See*, also, 47 C.F.R. §§ 15.501-15.525.

[6] Imaging systems consist of ground penetrating radars (GPR), wall imaging systems, through-wall imaging systems, surveillance systems, and medical imaging systems.

[7] 47 C.F.R. § 15.5. The operation of Federal Government radio stations is regulated by the National Telecommunications and Information Administration (NTIA), while operation of stations by commercial entities, state and local governments, and the general public is regulated by the Commission.

[8] 47 C.F.R. § 2.106.

[9] 47 C.F.R. §§ 15.209.

[10] 47 C.F.R. § 15.511. Section 15.511(a) requires that the bandwidth of a UWB surveillance system be contained between 1990 and 10,600 MHz, with the UWB bandwidth defined as the band bound by the points that are 10 dB below the highest radiated emission.

operation by, law enforcement, fire or emergency rescue organizations or manufacturer licensees, petroleum licensees or power licensees as defined in Section 90.7.[11]

5. UltraVision's UltraSensor is a UWB fixed radar surveillance system designed to operate in the spectrum region below 960 MHz, from 80 MHz to 600 MHz, and is intended to provide warning of intruders to sites with strategic or commercial interests. Each system consists of six to ten unlicensed transmitters buried 15-20 centimeters (6-8 inches) underground, below pavement or lawn turf, about every 20 meters (65 feet) around the site to be protected. The system tracks the location, velocity and mass of an intruder and can be programmed to ignore small animals, *e.g.*, birds and dogs, to respond only to pedestrians and vehicles, or to respond only to vehicles above a certain size or speed.[12] A collocated receiver analyzes the radar return signal. The UltraSensor system employs dithered pulses 2 nanoseconds (nsec) wide at a pulse repetition rate of 20-80 kHz, with a worst case duty cycle of 0.016%.[13] UltraVision claims that the UltraSensor system offers the following advantages as compared to other technologies: versatility in being able to distinguish between various different intrusion targets (birds, pedestrians, vehicles, etc.); concealed operation which is invisible to an intruder; tamper proof so that an intruder cannot disable it; and smart operation providing real-time distance and velocity of moving targets. UltraVision further claims that the system provides a low rate of false alarms,[14] which avoids a major distraction for security forces, and thus the system would help security personnel to focus on the threats that matter.[15] UltraVision argues that both government and private companies are more concerned than ever about securing their facilities against potential wrongdoers and urges the Commission to weigh the enhanced security that UltraSensor offers against its negligible interference potential.[16]

6. In its waiver request, UltraVision asks the Commission to waive Section 15.511(a) to allow its UltraSensor systems to operate on frequencies below 960 MHz, specifically those in the 80-600 MHz frequency range. UltraVision states that the UWB rules adopted in 2002 authorize specific applications operating in particular frequency bands because those applications reflect the technologies known to the Commission at the time of the rulemaking proceeding. UltraVision believes that the rules make no provision for these systems only because no manufacturer stepped forward to request operation of surveillance systems below 960 MHz and the UltraSensor technology did not exist at that time,[17] It further states that the UltraSensor system will comply with the technical requirements, *i.e.*, the emission limits specified for fixed surveillance systems in Section 15.511, which are the same as the Section 15.209 general emissions limits below 960 MHz. UltraVision argues that the rules allow UWB GPR devices to operate below 960 MHz and that the UltraSensor system is technically a GPR device adapted for use as a buried surveillance system, with its transmitter pointed upward toward a potential intruder,

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[11] 47 C.F.R. §§ 15.511 (b), 90.7.

[12] Request at 1.

[13] UltraVision request at 5 and reply comments at 9.

[14] UltraVision claims that other surveillance technologies suffer from susceptibility to frequent false alarms as they cannot distinguish the mass and velocity of intruding objects, thus they would trigger whether the intruder is a truck or a piece of paper moving in the wind. If the operator turns down the sensitivity to eliminate most of the false alarms, there is a good chance of missing the events the system was installed to detect. Request at 11-12.

[15] *Id.* at 6.

[16] *Id.* at 12.

[17] *Id.* at 6.

rather than downward into the ground.[18] It claims that even though the fundamental emissions of the UltraSensor system are located below 960 MHz, the system will have no greater potential for interference than fixed surveillance systems operating in accordance with Section 15.511.[19]

7. UltraVision also requests a waiver of Section 15.511(b), which limits the sale and operation of UWB fixed surveillance systems to law enforcement, fire and emergency rescue organizations, and manufacturing, petroleum or power licensees as defined in Section 90.7 of the rules.[20] UltraVision states that use of the UltraSensor system for other applications such as harbor facilities, government offices, high-value warehouses, financial institutions, and telephone switching offices is in the public interest and raises no greater threat of interference than those enumerated in the rules.[21] Therefore, in its request, UltraVision also seeks a waiver of the operational limitations of Section 15.511(b), to allow installation of the UltraSensor device on the premises of any party eligible for licensing under Part 90 of the Commission's rules.[22] Further, in lieu of the coordination requirement with Federal Government services in Section 15.511(b)(2), UltraVision proposes to maintain up-to-date records of the exact locations of all waivered installations, and to share that information with Commission and other agencies of the U.S. government on request.[23]

8. The Commission issued a Public Notice soliciting comments on UltraVision's request on October 24, 2006.[24] The Association for Maximum Service Television, Inc. (MSTV) filed in opposition, asking that the Commission deny UltraVision's waiver request.[25] MSTV states that the proposed UltraSensor system will cause harmful interference to television (TV) reception because the Section 15.209 emission limits under which this system would operate are insufficient to protect TV reception from unlicensed devices operating in the TV bands.[26] It cites a study conducted by the Canadian Research Centre Canada and MSTV that purports to demonstrate that unlicensed devices complying with the out-of-band emission limits of 15.209 could cause interference to digital TV sets at distances up to 24 meters (78 feet) and interference to analog TV sets up to 140 meters (452 feet).[27] MSTV notes that the issue of whether the Section 15.209 emission limits are sufficient to protect broadcast operations from harmful interference is at issue in the Commission's proceeding on unlicensed operation in the TV broadcast bands, ET Docket No. 04-186, and argues that it would be inappropriate for the Commission to

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[18] *See* description in UltraVision experimental license application at https://fjallfoss.fcc.gov/oetcf/els/reports/ViewExhibitReport.cfm?id_file_num=0105-EX-PL-2006&application_seq=32163 and exhibit 76721.pdf at https://fjallfoss.fcc.gov/els/GetAtt.html?id=76721&x=.

[19] Request at 7-8.

[20] 47 C.F.R. § 15.511 (b) and 47 C.F.R. § 90.7.

[21] Request at 10.

[22] *Id.* at 11.

[23] *Id.* at 14. The Commission's rules require the operator of the UWB device to provide the Commission's Office of Engineering and Technology with basic identifying information of the operator and areas of operation; the Commission, in turn, coordinates the operation with NTIA. *See* 47 C.F.R. §§ 15,511(b)(2), 15.525.

[24] *See* Public Notice, DA 06-2102.

[25] *See* MSTV comments at ii.

[26] *Id.* at 4-6.

[27] *Id.* at 6. *See* joint comments of MSTV and NAB filed Jan. 31, 2007 at page 23, in *In the matter of Unlicensed Operation in the TV Broadcast Bands, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band (TV White Spaces)*, ET Docket Nos. 04-186 & 02-380, 21 FCC Rcd 12266 (2006).

grant a waiver that relies on compliance with this rule until that issue is addressed in the pending rulemaking proceeding.[28] MSTV contends that a demonstration conducted for it by UltraVision of an UltraSensor device shows that the relatively short pulse and low duty cycle of the UltraSensor device does not prevent interference to analog or digital TV reception. With respect to UltraVision's request to expand the list of eligible entities to which the UltraSensor device may be marketed, MSTV contends this will exacerbate the device's interference potential and will make the interference problem difficult to eliminate.[29]

9. MSTV also raises legal and procedural issues regarding UltraVision's request. MSTV argues that UltraVision has not met the waiver standards because it fails to show that the underlying purpose of the UWB rules would be frustrated by an application of the rules to UltraSensor or that there are "unique circumstances" which would make application of the rules "inequitable, unduly burdensome or contrary to the public interest."[30] MSTV contends that the Commission must exercise greater caution when evaluating a waiver petition because of the lack of full examination based on technical studies and that the Commission has previously decided to treat UWB devices as new products whose "operation should be limited until more experience is obtained."[31]

10. In response to the MSTV opposition, UltraVision states that the informal demonstration of interference from the UltraSensor system to TV reception at MSTV's offices should not be extrapolated to conclude that the UltraSensor system will cause interference under actual usage scenarios because the actual distance to the sensor from the TV set, as well as the strength of the TV signal and other relevant factors were not formally measured.[32] UltraVision also argues that the cited Canadian/MSTV technical study examines interference caused by an orthogonal frequency division multiplexing (OFDM) signal source, which has a large fraction of the permitted quasi-peak maximum emissions. UltraVision contends that UltraSensor uses a pulsed signal with a very low duty cycle, which puts its average signal very far below the quasi-peak readings, thus UltraSensor's signal would be far less interfering than an OFDM source.[33] Nonetheless, UltraVision states that it will accept the separation distance as specified in the MSTV's study as a condition of its waiver grant, even though its pulsed technology would probably need less separation distance. It therefore agrees to avoid installations of an UltraSensor device within 140 meters (452 feet) of a residentially zoned area through February 18, 2009 or within 24 meters (78 feet) after that date.[34] UltraVision acknowledges that the Commission determined in another waiver proceeding that it could protect licensed services by imposing a specific separation distance between a UWB unit and areas accessible to the public.[35] UltraVision amended its original request to agree to install

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[28] *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band First Report and Order and Further Notice of Proposed Rule Making*, ET Docket Nos. 04-186 & 02-380, 21 FCC Rcd 12266 (2006).

[29] *Id.* at 4.

[30] *Id.* at 7. *See also* 47 C.F.R. § 1.925.

[31] MSTV comments at 11, citing *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems First Report and Order*, 17 FCC Rcd. 7435 (2002) at ¶29.

[32] UltraVision reply comments at 9. This statement agrees with MSTV's description of the informal demonstration. *See* Appendix to MSTV's comments.

[33] UltraVision reply comments at 9-10.

[34] *Id.* at 10. February 18, 2009 is the effective date when analog TV transmission must cease.

any waivered device no closer than 24 meters (78 feet) to the nearest boundary of the customer's site, for the duration of the waiver period.[36]

11. In rebutting MSTV's legal and procedural argument, UltraVision argues that it has demonstrated the "unique circumstance" of a technology capable of serving the nation's security needs in ways not otherwise possible, at lower emission levels than are provided for under the rules.[37] It contends that to the extent that the rules block this technology, they are inequitable, burdensome and contrary to the public interest. UltraVision believes that its proposed separation distances would help address all of MSTV's concerns.[38]

III. DISCUSSION

12. We are authorized to grant a waiver under Section 1.3 of the Commission's rules if the petitioner demonstrates good cause for such action.[39] Good cause, in turn, may be found and a waiver granted "where particular facts would make strict compliance inconsistent with the public interest."[40] To make this public interest determination, the waiver cannot undermine the purposes of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.[41] The technical and operational standards of Section 15.511(a) and the permitted users' provision of Section 15.511(b) exist to ensure that UWB fixed surveillance systems do not harmfully interfere with authorized radio services, including Federal Government services. As discussed below, if appropriate operational and technical conditions are imposed on the waiver, a waiver of the frequency band and user requirements in Section 15.511(a) and (b) can be granted without increasing the potential for harmful interference. Hence, granting this waiver will not undermine the purpose of the rules. Finally, there is a stronger public interest benefit in granting this waiver than in strictly applying the rules. As discussed below, a denial would prevent the availability of systems that would ensure protection of a broad variety of secured facilities (e.g., transportation, law enforcement and commercial) that are important to the public well-being. These secured facilities currently are not eligible for the important benefits of this proposed system. In addition, a grant of the waiver would serve the public interest by encouraging providers such as UltraVision to commit financial and other resources to provide important systems such as the one

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[35] *Id.* at 11. *See In the Matter of Curtis-Wright Controls, Inc. Embedded Computing Petition for Waiver of the Part 15 Ultra-Wideband (UWB) Regulations, Order,* DA 07-198, in which the Commission requires a separation distance of 110 meters between a waivered high power UWB device and areas accessible to the public.

[36] UltraVision *ex parte* filed June 21, 2007 at 2.

[37] UltraVision reply comments at 13-14.

[38] *Id.* at 14. MSTV did not respond to UltraVision's reply and *ex parte* comments regarding separation distances.

[39] 47 C.F.R. § 1.3. *See also ICO Global Communications (Holdings) Limited v. FCC,* 428 F.3d 264 (D.C. Cir. 2005); *Northeast Cellular Telephone Co. v. FCC,* 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC,* 418 F.2d 1153 (D.C. Cir. 1969).

[40] *Northeast Cellular,* 897 F.2d at 1166; *see also ICO Global Communications,* 428 F.3d at 269 (quoting *Northeast Cellular*); *WAIT Radio,* 418 F.2d at 1157-59.

[41] *See, e.g., WAIT Radio,* 418 F.2d at 1157 (stating that even though the overall objectives of a general rule have been adjudged to be in the public interest, it is possible that application of the rule to a specific case may not serve the public interest if an applicant's proposal does not undermine the public interest policy served by the rule); *Northeast Cellular,* 897 F.2d at 1166 (stating that in granting a waiver, an agency must explain why deviation from the general rule better serves the public interest than would strict adherence to the rule).

proposed. Accordingly, we find good cause exists for granting a waiver with the conditions described below.

13. We find that the UltraSensor system is an innovative application of existing GPR technology which would provide a reliable means of protection of secured facilities that are important to the public well being. While the UltraSensor device does share the low duty cycle characteristics of GPRs, we find that the UltraSensor device is different from GPRs in several respects. First, the emissions from the UltraSensor device are directed upward rather than downward toward the ground. Second, the UltraSensor device would not operate at infrequent intervals, but would operate continuously at fixed locations. Finally, the market for surveillance systems is significantly different than the market for GPRs, which could lead to higher proliferation of the UltraSensor system than was envisioned for GPR use of the band below 960 MHz. We determine that, in the case of UltraVision's UltraSensor, the potential for interference resulting from operating in the 80-600 MHz frequency range and operation by any entity eligible for licensing under Part 90 of the rules can be balanced by operational and technical restrictions. As the Commission has noted previously, the interference potential of unlicensed UWB devices to authorized services can be controlled by several factors.[42] Limits on the average and peak emission levels produced by the devices are one method of controlling potential interference. The potential for interference also can be reduced by limiting the applications for which the devices may be employed, the manner in which the devices may be operated, and the number of devices deployed. As discussed below, we will apply appropriate conditions in these respects on the operation and marketing of the UltraSensor system to guard against interference to authorized users in these bands.

14. First, we will require that the UWB bandwidth of the UltraSensor devices be located between 80 and 600 MHz, and that the radiated emissions at or below 960 MHz from an UltraSensor device operating under this waiver shall not exceed the emission levels in Section 15.209.[43] Above 960 MHz, the UltraSensor device shall not exceed the emission levels pertaining to ground penetrating radars and wall imaging devices in Section 15.509.[44] These emission limits, in combination with the operating constraints we are placing on UltraSensor devices, will minimize the potential for harmful interference to authorized federal and non-federal systems.[45]

15. We will also require that the UltraSensor devices be installed beyond a minimum of 24 meters (78 feet) distance separation to the nearest boundary of the customer's property at any location for the duration of the waiver period. MSTV alluded to this separation distance with respect to digital television receivers in its comments and UltraVision has voluntarily agreed to comply.[46] We believe this distance will serve to reduce the likelihood of harmful interference from the UltraSensor systems to all licensed operations, based on several factors: a) UltraSensor's dithered pulse signals[47] have very low duty cycle and the system's operation six to eight inches below ground will mitigate any potential interference;

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[42] *See Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems Second Report and Order and Second Memorandum Opinion and Order* (*2nd R&O and 2nd MO&O*), ET Docket 98-153, 19 FCC Rcd 24558 (2004) at ¶13.

[43] 47 C.F.R. § 15.209.

[44] 47 C.F.R. § 15.509.

[45] Using the Part 15.209 radiated emission limits and the limit on the number of UltraSensor systems that can be sold under this waiver, NTIA determined there would be no impact on SARSAT operations.

[46] MSTV comments at 6 and UltraVision reply comments at 10.

[47] When combined with a random, or "dithered", pulse repetition interval (PRI), a UWB emission spectrum is spread to the point where it resembles noise, which can aid in interference reduction.

and b) the extremely low power employed by these devices and the higher horizontal propagation losses resulting from their buried locations should also eliminate any potential impact.[48] Although the UltraSensor system is a GPR device radiating upward, and thus raising concerns regarding vertical emissions, UltraVision has submitted test data to show that the system's vertical emissions can be adequately characterized by using measurement procedures similar to those used for GPR devices, and that the maximum vertical emissions are less than or within 0.2 dB of the maximum horizontal emissions at all frequencies.[49] We believe that UltraSensor systems operating as described above will not pose a risk for harmful interference to authorized services and that any residual potential for interference would only affect a party that is actually within the detection sphere of the system, and whose presence the system is designed to prevent. To ensure that the system is properly installed to operate under the conditions specified in this waiver, we will require that UltraSensor systems be installed by professional licensed security companies.

16. In addition, we will require that the UltraSensor devices not operate for the duration of the waiver period within 140 meters (452 feet) of an area zoned to include residential development (including mixed-use areas), and areas where cable headends are located, in order to provide an additional measure of protection for analog broadcast operations from interference.[50] Here, too, MSTV alluded to this separation distance with respect to analog television receivers in its comments and UltraVision has voluntarily agreed to comply.[51] Although UltraVision has suggested that this separation distance only be required until February 18, 2009 when the digital television transition is complete, we note that there are three other categories of broadcast television stations operating in these bands–"low-power", "Class A", and "translator" stations–that have no deadline to convert to digital broadcasting at the present time.[52] Because these stations may continue to operate with analog signals after February 18, 2009, we find that the separation distance that UltraVision is willing to meet to protect analog broadcast operations should be maintained for the duration of the waiver period.

17. We further find that MSTV's concerns of interference to broadcast services in these bands are mitigated with the required minimum separation distances, as discussed *supra*. The required minimum separation distances will result in significant signal attenuation at the customer's boundary and provide further protection to broadcast operations in residential areas. We also observe that our approach here is consistent with Commission regulations that allow unlicensed biomedical telemetry devices to

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[48] Requiring a minimum separation distance is consistent with Commission's actions in several proceedings. *See* discussion in ¶15, infra.

[49] UltraVision *ex parte* filed Sep. 28, 2007.

[50] The headend is the origination point for signals in the cable system. It has parabolic or other appropriately shaped antennas for receiving satellite-delivered program signals, high-gain directional antennas for receiving distant TV broadcast signals, directional antennas for receiving local signals, machines for playback of recorded programming and commercial insertion, and studios for local origination and community access programming. Although cable headends are not generally located in residentially zoned areas, cable headend reception equipment is important for the reception of broadcast TV and thus must be protected. *See* Ciciora, Walter, et al. Modern Cable Television Technology: Video, Voice and Data Communications, 2nd Edition. Morgan Kaufmann Publishers, 2004.

[51] MSTV comments at 6 and UltraVision reply comments at 10.

[52] *See* FCC Consumer Advisory Notice, *The DTV Transition and LPTV/Class A/Translator Stations*, available at http://www.fcc.gov/cgb/consumerfacts/DTVandLPTV.html. *See also*, 47 C.F.R. §74.602(h)(4). Full power TV broadcast stations will convert to digital transmissions by February 18, 2009.

operate under Sections 15.241 and 15.242[53] within the TV bands at power levels significantly higher than the general emission limits of Section 15.209.[54] The interference potential of these higher powered medical devices is limited by restricting the types of medical facilities where they may be operated,[55] and by ensuring that minimum separation distances are maintained between the biomedical telemetry devices and authorized users of the bands.[56] We find that a similar approach is warranted in this case,[57] and thus are requiring minimum separation distances to be maintained between the UltraSensor devices and the boundary of the customer's premises, and between the UltraSensor devices and residentially zoned areas. We thus conclude that these additional safeguards make it unnecessary to delay a decision on this waiver request until the Commission addresses in a pending rulemaking proceeding whether the Section 15.209 emission limits are sufficient to protect broadcast operations from harmful interference, as MSTV suggests.

18. We also find that a limited waiver of the marketing restrictions of Section 15.511(b) will not result in widespread proliferation of the UltraSensor device that would increase the risk for interference to authorized services. In this respect, we will continue to prohibit sales and marketing of UltraSensor to consumers, and will limit purchasers and operators of the UltraSensor system to entities eligible for licensing under Part 90 of our rules. We further agree with MSTV that greater caution should be exercised regarding UWB devices, and we will limit the number of installations allowed under this waiver to one hundred in the first year following the effective date of this Order and to an additional two hundred and fifty in the second year, for a total of three hundred and fifty devices at the end of the second year. Our decision to limit the number of devices and to allow for their gradual deployment is a cautious approach, so that harmful interference issues can easily be addressed should they occur. Devices deployed under the terms of this waiver will be allowed to continue to operate after the two-year deployment period ends, provided there is no harmful interference to authorized operations.[58] After we have gained experience with UltraSensor system pursuant to this waiver, UltraVision may request that this waiver be extended to allow the marketing of additional systems at the end of the two-year waiver period.

19. Requiring the UltraSensor system to be installed at fixed and permanent locations is consistent with our rules for surveillance systems, which are required to operate in fixed locations so that

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[53] While equipment approval for medical telemetry devices may no longer be obtained under Sections 15.241 and 15.242, it is important to note that these devices were subjected to equipment approval to protect the wireless medical telemetry devices from interference caused by TV Broadcast stations, and not because of interference being caused to the reception of broadcast TV.

[54] Devices authorized under Section 15.241 are permitted to operate with field strengths of any emission radiated within a specified 200 kHz band not exceeding 1500 microvolts per meter at 3 meters, while emissions radiated on any frequency outside the 200 kHz bandwidth are limited to the Part 15.209 general emission limits of 150 microvolts per meter at 3 meters. 47 C.F.R. § 15.241(c). Devices operating under Section 15.242 are permitted to operate at a much higher emission limit of 200 millivolts per meter at 3 meters, with out-of-band emissions limited to the Part 15.209 general emission limits of 150 microvolts per meter at 3 meters. 47 C.F.R. § 15.242(c).

[55] 47 C.F.R. §15.242(a).

[56] 47 C.F.R. §15.242(d).

[57] We note here that below 960 MHz UltraSensor operates within the existing emission limits of Section 15.209.

[58] UltraVision will have to seek permission to deploy more than 350 devices or to extend the deployment period beyond two years.

the source of harmful interference, if it occurs, can be readily identified and corrected.[59] We decline to grant UltraVision's request that we waive the coordination provision with NTIA for UWB devices operating in these bands, and that we instead only require that UltraVision maintain a list of installations. The coordination requirement in Section 15.511(b)(2), as detailed in Section 15.525, provides advance notice to authorized Federal users of UWB operations in their area and allows Federal users to readily identify any potential source of interference.[60] The requirements of Section 15.525(f) limiting the coordination of routine UWB operations to no longer than 15 business days from the receipt of the coordination request by NTIA, will still be applicable.

20. We also will require UltraVision to obligate parties who purchase UltraSensor systems to operate them consistent with the terms of this Order. The provisions of 47 C.F.R. §2.939(a) allow the Commission to revoke the certification grant, if UltraVision or any operator of these devices fails to comply with the obligations placed on them in accordance with the equipment authorization program.[61] We reiterate that as an unlicensed device, an UltraSensor system must be operated under the general non-interference requirements of Section 15.5 of our rules. Under these rules, the operator of an UltraSensor system is responsible for eliminating any harmful interference that may occur or must cease operation upon notification by a Commission representative that the device is causing harmful interference.[62] Accordingly, we will require that UltraVision inform purchasers and operators that UltraSensor devices must be operated in accordance with all of the conditions of this waiver, that any harmful interference that occurs must be corrected or operation must cease, and that modifications to the operating conditions of UltraSensor devices may be required if harmful interference is caused to new or expanded deployments of protected federal government systems.

Summary of Waiver Conditions

21. Summarizing the above, the following conditions shall apply to the waiver being granted to UltraVision Security Systems, Inc. for its UltraSensor surveillance systems:

1) Compliance testing shall be carried out on the device as typically installed (including being oriented in an upward position). The device may be buried under 15 centimeters (six inches) of dry sand (to simulate being installed under turf or asphalt.) In all other respects, compliance testing shall follow the Commission's rules and measurement procedures to find and maximize the radiated emissions from the device. This shall include the adjustment of the angle of the measurement test antenna to maximize the levels of the measured radiated emissions.

2) All installations of UltraSensor imaging devices operated under this waiver shall be restricted to fixed, underground (turf or asphalt) permanent locations. Devices shall be buried a minimum depth of six inches.

3) All installations of UltraSensor devices operated under this waiver shall be carried out by professional licensed security companies.

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[59] *See Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems First Report and Order*, 17 FCC Rcd. 7435 (2002) at ¶55.

[60] 47 C.F.R. §§15.511(b)(2),15.525.

[61] *See* 47 C.F.R. §2.939(a), which states "[t]he Commission may revoke any equipment authorization:...(2) if upon subsequent inspection or operation, it is determined that the equipment does not conform... to the representations made in the original application."

[62] 47 C.F.R. § 15.5.

4) All installations of UltraSensor devices operated under this waiver must be no closer than 24 meters (78 feet) to the nearest boundary of the customer's site. The distance of the separation zone shall be measured from the antenna in every direction. In addition, the devices may not be installed within 140 meters (452 feet) of an area zoned to include residential development (including mixed-use areas), and areas where cable headends are located.

5) UltraVision shall limit the number of systems installed under this waiver to one hundred (100) systems during the first twelve months following the grant of this waiver and to an additional two hundred and fifty (250) during the second twelve months, for a total of no more than three hundred and fifty (350) systems at the end of two years. (A "system" may comprise any number of transmitters that are connected to a co-located central control system.)

6) UltraVision shall inform purchasers and operators that UltraSensor devices must be operated in accordance with all of the conditions of this waiver, that any harmful interference that occurs must be corrected or operation must cease, and that modifications to the operating conditions of UltraSensor devices may be required if harmful interference is caused to new or expanded deployments of protected federal government systems.

7) The -10 dB bandwidth of the UltraSensor device shall be contained in the 80-600 MHz frequency range. The device shall comply with all applicable rules in Part 15, including the requirement in Section 15.201 to obtain a certification grant, except for the standards in Sections 15.511 (a) and (b).

8) The radiated emissions at or below 960 MHz from UltraSensor devices operating under the provisions of this waiver shall not exceed the emission levels in Section 15.209. The radiated emissions above 960 MHz from UltraSensor devices operating under the provisions of this waiver shall not exceed the emission levels for ground penetrating radars and wall imaging devices in Section 15.509.

9) Sales of UltraSensor devices to consumers are prohibited. Purchasers and operators of UltraSensor devices are limited to entities eligible for licensing under Part 90 of our rules.

10) UltraVision shall comply with the coordination requirement in Section 15.511(b)(2), as provided in Section 15.525. In addition, the UltraSensor device may not be operated until such time that the location and installation of the equipment has been coordinated with, and acknowledged by the Commission.

11) This waiver shall apply to the UltraSensor device produced by UltraVision as described herein, provided no major changes are made to the transmitter circuitry that would modify the device's modulation, pulse characteristics, or increase its duty cycle, radiated power, or bandwidth.

IV. CONCLUSION AND ORDERING CLAUSE

22. Accordingly, pursuant to authority in Section 1.3 of the Commission's rules, 47 C.F.R. section 1.3, and Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 302, 303(e), and 303(r), IT IS ORDERED that the Request for Waiver filed by UltraVision Security Systems, Inc. IS GRANTED IN PART AND DENIED IN PART, consistent with the terms of this Order. This action is effective upon release of this Order.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary