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May 7, 2021

Mr. Martin Proulx D
Director General
Engineering, Planning and Standards Branch
Innovation, Science and Economic Development Canada
235 Queen Street (6th Floor, East Tower)
Ottawa ON K1A OH5

Re: Comments on Radio Standard Specifications RSS-222, issue 3 and Database Specifications DBS-01, issue 3

The Dynamic Spectrum Alliance (DSA)[1] submits these comments in response to Innovation, Science and Economic Development Canada's (ISED) consultations to update its two key regulatory documents regarding licence-exempt operations in the broadcast television white space (WS). These two proposed updated documents are *RSS-222, issue 3 – White Space Devices (WSDs)*[2] and *DBS-01, issue 3 — White Space Database Specifications.*[3] DSA's comments will cover both documents.

[1] The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small- and medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members.

[2] Radio Standard Specification RSS-222, issue 3, *White Space Devices (WSDs)*, Innovation, Science and Economic Development Canada, released February 26, 2021. https://www.rabc-cccr.ca/ised-radio-standard-specifications-rss-222-issue-3-february-2021-draft-white-space-devices-wsds/ (RSS-222).

[3] Database Specification DBS-01, issue 3, *White Space Database Specifications*, Innovation, Science and Economic Development Canada, released February 26, 2021. https://www.rabc-cccr.ca/ised-white-space-database-specification-dbs-01-issue-3-february-2021-draft-white-space-database-specifications/ (DBS-01).

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Overall, DSA strongly supports the proposed changes to both RSS-222 and DBS-01. In particular, the removal of reference to taboo channel rules in RSS-222 is a significant change that will increase the number of available channels for WSD use and remove a barrier to entry for Canadian Wireless Internet Service Providers (WISPs) interested in providing broadband service over the WS.

The DSA also applauds several other proposed changes that will increase the coverage area of a WSD-based network. These include an increase in the EIRP limit of fixed WSDs operating in less congested areas to16 Watts (W), updating the minimum separation distance between WSD's and the broadcast television station's protected contour, and elimination of the fixed WSD antenna having to meet an effective height above average terrain (EHAAT) and height above ground level (AGL) limit concurrently. The removal of the height AGL limit will enable increased coverage in regions such as the Canadian plains, where the terrain is flat, and depending on the fixed WSD EIRP limit, the height AGL limit could be hundreds of meters less than the EHAAT limit. Under the current rules, the typically lower height AGL limit prevails.

Additionally, both in DBS-01, issue 3 and RSS-222, issue 3, the DSA supports the new language authorizing the operation of mobile WSDs within a defined geo-fence area in less congested areas. Higher power 'fixed' WSDs that can be moved within the geofence will be able to support rural industries. These WSDs are envisioned to be fastened to different types of industrial vehicles and equipment.

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The DSA is also in agreement with ISED's proposal to add text to both RSS-222, issue 3, and DBS-01, issue 3, regarding the operation of narrowband WSDs. We agree that, depending on the use case, narrowband can be either a fixed or personal portable WSD. Potential users of the narrowband technology will benefit from the additional proposed regulatory flexibility. DSA interprets ISED's proposal to mean that narrowband WSDs could operate as either a master device or a client device within a network. If this interpretation is correct, it may be beneficial for ISED to make this clarification explicit in one or both of the documents.

The DSA believes it may also be necessary for ISED to make clear that there is no additional burden on White Space Database (WSDB) Administrators with respect to narrowband WSDs. The DSA's understanding from its members is that narrowband WSD systems may use different network topologies. One such topology is the hub and spoke, where each narrowband WSD spoke communicates back to the narrowband or fixed WSD hub. The hub aggregates the data and communicates the information over the Internet. The hub also queries the WSDB for a list of available channels on behalf of itself and its distributed spokes.

The other narrowband WSD network topology is where the narrowband device communicates through a gateway directly to the cloud. In this case, firmware in the narrowband device will have to identify the 6 MHz broadcast TV channel it falls within. For either network topology, the query to the WSDB for a list of available channels must look to the WSDB (under the rules) as if it came from a fixed WSD operating at 4 W EIRP. The process by which the

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information required for a narrowband WSD query is converted into a format that the WSBD Administrator can use is the responsibility of the narrowband WSD network operator / equipment provider, not the WSDB Administrator.

One issue that DSA has raised in a previous ISED filing[4] and bears repeating here is the protection of Wireless Medical Telemetry Service (WMTS) systems operating on channel 37 from fixed and personal / portable WSDs. The DSA recognizes that, unlike the in United States, Canadian medical facilities using WMTS do not have to register the location of their systems with a database administrator of any type. Nevertheless, DSA believes there are better ways to manage the risk of harmful interference to these systems operating on channel 37 from emissions coming from lower adjacent channels than the current practice.

ISED currently requires a very stringent WSD emissions mask for channels 35 through 39 to meet the field strength emissions limits for 602-620 MHz. Identical field strength emission limits for 602-620 MHz were required by the U.S. Federal Communications Commission (FCC) between 2008 and 2015.[5] In its 2015 update to its white space rules,[6] the FCC specified that a WSD has to meet the adjacent channel emissions limits within the first 6 MHz (first adjacent

[4] Comments of the Dynamic Spectrum Alliance, *White Space Devices*, RSS-222, Issue 2 Draft 1 External – released June 13, 2019, filed August 23, 2019, at 5-6.

[5] *See* RSS 222, Section 11.5.2.

[6] See U.S. Code of Federal Regulations, Title 47, Part 15, Section 709 (d).

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channel), which correspond to the values in RSS-222, Table 4 of Section 11.4.1. Beyond the first adjacent channel, WSDs have to meet the radiated emission requirements of 47 CFR § 15.209,[7] which corresponds to Section 7.3 (Receiver radiated emissions limits) of ISED's *General Requirements for Compliance of Radio Apparatus*.[8]

Additionally, under the FCC's rules, fixed WSDs need to maintain a small separation distance from the perimeter of each WMTS facility. Rather than establishing the minimum separation distance to protect the WMTS receiver from receiving blocking interference from outside the band, the separation distance is based on a signal level considerably weaker than the WMTS receiver sensitivity, which leads to a larger separation distance. Further, the model assumed no building entry loss, no clutter, and assumed the fixed WSD and WMTS receiver(s) operated at the same height. Given the typical placement of WMTS antennas within a facility a fixed WSD signal would be coming in from the outdoors and propagating in a direction either orthogonal-, or downward to the WMTS receiver, resulting in building entry loss. Even a modest amount of building entry loss would obviate the need for a separation distance between fixed WSDs operating at up to 4 W EIRP on channel 36 and the WMTS facility.

[7] See U.S. Code of Federal Regulations, Title 47, Part 15, Section 209 (a).

[8] RSS-Gen, issue 5 - *General Requirements for Compliance of Radio Apparatus,* ISED Canada, April 2018 at Section 7.3.

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For this reason, the DSA believes that if a WSD device meets ISED's limits for conducted adjacent channel emissions on the first adjacent channel and meets the radiated emission requirements of Section 7.3 on higher order adjacent channels, the risk of harmful interference to WMTS system operations would be extremely low, even without the WMTS system operator's ability to register its location in the WSDB.

To provide an additional degree of protection, DSA suggests that ISED consider the risk of harmful interference from fixed and personal / portable WSDs to WMTS systems separately. In the United States, the greatest concern expressed by WMTS interests was the potential of co-channel interference caused by personal / portable devices. The argument was that personal / portable WSDs carried would be within or close to a WMTS facility and be able to receive a signal from a nearby access point. Rather than enter into a debate on the range of low-power personal / portable WSD access points, ISED should set this device category aside regarding the issue of the field strength emissions limits between 602-620 MHz and focus on fixed WSDs that are operated outdoors and are intended to provide broadband access.

Fixed WSDs operate point-to-multi-point. The geo-coordinates of fixed WSDs are registered in the WSDB. The fixed WSD based station can have an EHAAT that is considerably higher than the typical height of hospitals in rural areas. The customer premise equipment (WS receiver) is assumed to be several meters above the ground. Before WSD networks commence operations there is a testing phase whereby the operator would be able to easily assess whether

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there is a potential for adjacent channel interference to a WMTS system within its proposed coverage – especially in less densely populated areas of Canada.

DSA believes that the number of WMTS systems deployed in Canada and their distribution across the country can also reduce the problem to a manageable size. DSA's expectation is that the location and density of WMTS deployments in Canada reflects the country's population distribution (e.g., more WMTS deployments within 10's of kilometers of the Canada – United States border). Permitting fixed WSDs to operate on channel 36 in less congested areas at up to 16 W EIRP and up to 4 W EIRP elsewhere would facilitate use of the spectrum to provide broadband access to less densely population parts of Canada. The DSA recalls that ISED chose not to relocate any broadcast TV stations displaced by the repurposing of the 600 MHz band to channel 36.[9] Most critically, ISED should eliminate the unique Canadian-market emissions mask required to meet the field strength emissions limits for channels 35 through 39.

Under the current rules, it will be impossible for fixed WSDs certified for the U.S. market to be certified for the Canadian market without the addition of this special emission mask for each WSD base station and CPE. It would require a new stock keeping unit (SKU) for a

[9] " It should be noted that channel 37 will continue to be used for Radio Astronomy Systems and wireless medical telemetry services. Additionally, no Canadian broadcaster is being moved to channel 36 or 37, which will reduce the potential for interference to broadcast services from the mobile services and vice versa.", *Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band,* SLPB-005-17, ISED Canada, August 2017.

Canadian market that is still in the nascent stage of development. The non-recurring engineering cost to design, develop, and produce the stringent emissions filter exclusively for the Canadian market will have to be spread over a limited number of fixed WSD units. This may become a practical barrier to entry for WSD manufacturers interested in entering the Canadian market.

Additionally, such a stringent field strength emissions limits 602-620 MHz for a relatively low power transmitter (4 Watts EIRP) would seem inconsistent with ISED's approach to ensuring high power 5G transmitters operating in the 600 MHz band do not cause harmful interference to WMTS systems operating on Channel 37. The radiated power and antenna height limits for these base stations can be in the thousands of Watts under the Canadian rules depending on their location.[10] The 600 MHz downlink A block transmitter will use the standard wireless industry 43+10log(P) emission mask. Note that the 600 MHz A-block downlink starts at 617 MHz, which falls within the frequency range where the field strength emissions limits for WSDs apply. Even with a 3 MHz guard band between 614-617 MHz, DSA assumes there is going to be significant adjacent channel emissions from the A-block downlink into channel 37. If Canadian WMTS facilities have had to upgrade their bandpass filters to protect against the 600 MHz A-block downlink signal, surely these filters will also provide more than adequate

[10] *Technical Requirements in the Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz*, Technical Criteria, SRSP-518, issue 2, ISED Canada, February 2019, at Section 5 (Technical Criteria). Also interesting is Section 8, entitled Coexistence of Systems Operating in Adjacent Bands. Presumably, even with a 3 MHz guard band, the WMTS band is considered an adjacent band to the 600 MHz A-block downlink.

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protection from WSD transmission that are no greater than -36 dBm (-42 dBm conducted adjacent channel leakage plus 6dBi gain from the WSD's antenna).

Finally, the DSA suggested that ISED replace the phrase '95 percent accuracy' with '95 percent confidence' throughout both texts. The DSA understands the intent of the phrase, but in practice, there is a difference in meaning that could prove problematic at a later time.

Once again, the DSA congratulates ISED on its proposed updates to the RSS-222 and DBS-01. We believe these changes remove regulatory barriers and will accelerate the deployment of fixed WSDs in Canada to provide another option in rural areas for broadband access. These rules changes also support innovation by creating a new mobile WSD category that can operate with a geo-fenced area and through requirements enabling narrowband WSDs that can be used for the Internet of Things applications. The only concern DSA has is the unique Canadian emissions mask to protect WMTS systems operating on channel 37. Some creative solution needs to be found.

Respectfully submitted,

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