



# TCBC Workshop News

**OCTOBER 2020**

**Empowering Trust<sup>®</sup>**

The TCB Council semi-annual workshop has ended. As with the April meeting, this was a webinar with over 200 attendees and presenters all connected remotely. Many thanks to the TCB Council for forging ahead with the conference in its virtual format and a big thanks to all the presenters for showing up!

Here are the main highlights.1

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## Revision History:

Revision 1.0, First release October 27, 2020

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### **FCC 9**

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1 FCC presentation material should be available on the FCC site at <http://transition.fcc.gov/oet/ea/presentations/>. The TCB Council posts all presentations for **members** to access on the [TCBC Workshop Archives](#).

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## NIST and MRA updates

NIST (Ramona Saar and Natalie Roux) gave a review of the current status telecommunications mutual recognition agreements (MRAs) between the U.S. and other economies. Michael Derby provided a complementary update from the RED-CA meeting held the previous week.

## European Union RED article 3.3

The only mandated section of Article 3.3 that is considered an essential requirement is Article 3.3 (g) of the Radio Equipment Directive related to Emergency Services. As noted in last November's workshop, a *Delegated Act* will apply from March 17, 2022, and standards are being mandated.

Article 3.3 (d), which addresses protections for the network, is under review and would apply to internet connected devices. The proposed definition of "internet connected devices" is *any radio equipment, falling within the scope of Directive 2014/53/EU, which is capable to be connected, either directly or indirectly, including via another equipment, to internet.*

Articles 3.3 (e) and (f), related to privacy requirements and fraud safeguards, are being actively reviewed, and an impact assessment will be made with the goal of adopting a delegating Act by March 2021. This would trigger a review by the European Council, which would take up to four months, followed by a request for standards to assess devices against the requirements. Article 3.3(e) is being considered for internet connected devices, toy devices and wearable devices that are capable of processing information or data covered by Regulation (EU) 2016/679 (GDPR) or Directive 2002/58/EC (ePrivacy), and the scope of Article 3.3 (f) would be for internet connected devices in so far as they enable the holder or user to transfer money, monetary value or virtual currency.

An impact assessment study is in process for Article 3.3 (i) related to software configurable radio and is under assessment with a delegated act is in the works. Refer to the [Europa Site](#) for latest details.

There were no updates on Article 3.1(a) common charger requirements for cell phones and similar consumer portable devices since the [impact report](#) that was referenced in April's meeting

## Brexit

As I write this, it seems that the U.K. and EU are moving further apart in trying to find a mutually agreeable exit strategy for the U.K. The UKCA mark will be required for goods that would be subject to CE marking if they are to be sold in the U.K. (note that there will probably be different requirements for Northern Ireland). The UKCA marking will come into effect on Jan. 1, 2021, but most device manufacturers may continue to use the CE marking until Jan.1, 2022, with an additional allowance of not having to place the UKCA mark the product until 2023 provided that the UKCA mark is on the packaging or documentation supplied with the device.

While manufacturer's may start using the UKCA mark on devices now, the fact that there are no designated standards<sup>2</sup>, for example Radio Equipment, and no Conformance Assessment Bodies<sup>3</sup> yet designated to issue a type examination certificate, it is not possible to place the UKCA mark on any radio equipment or other devices that either require the use of designated standards and/or require type examination.

A U.S.-U.K. MRA is ready to be signed once the U.K. is no longer operating under the transition period (i.e., after Dec.31, 2020), although some recent reports might suggest that some U.S. politicians might want the U.S. to withdraw from such an MRA if the Northern Ireland border is not left open.

## European Union REDCA meeting

The REDCA is working on updates to their guidance documents, known as Technical Guidance Notes (TGNs), related to risk assessment (TGN 30) and SAR testing (TGN 20).

France introduced requirements for the SAR values to be listed in the manual and at the point of sale for devices that require SAR testing (most portable devices operating with powers greater than 20 mW). They recently lodged a complaint on the EN 50566 SAR standard that allows a distance of up to 5 mm for body SAR tests but France wants the standard to require testing at 0 mm separation distance.

CEPT reports looking at WLAN (Wi-Fi) in the 6 GHz band have been released (Reports 73 and 75). REC 70-03 was updated in June to add information for short range devices operating below 9kHz

## South Korea

The RRA has extended calibration intervals to account for COVID-19 and availability of calibration laboratories and will permit temporary six-month recalibration interval extensions under the following schedule:

- Equipment with calibration dates falling between Sept. 1, 2020, and March 1, 2021, will have a calibration due date extended up to six months from current date.
- Equipment with calibration dates falling after March 1, 2021, the calibration due date can be extended for a shorter period of time until no later than Sept. 1, 2021.
- Equipment with calibration dates after Sept. 1, 2021, must meet the calibration intervals stipulated in Korea's legal requirements.



Any extensions must adhere to ISO 17025 requirements and must be documented by the laboratories, laboratories must inform their designating authority (DA) of any extensions, and the DA will inform RRA. NIST noted that RRA has requested the first NIST report regarding CAB extensions by November 2020

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<sup>2</sup> Designated standards are the U.K. equivalent of harmonized standards. Under the U.K.'s equivalent to the Radio Equipment Directive, when delegated standards are not used to address the essential requirements related to radio spectrum usage, type examination by a U.K.-recognized approval body is required.

<sup>3</sup> Approval body is the U.K. equivalent to an EU notified body.

## ISED Canada



**HAC:** A reminder that RSS-HAC (Issue 1) will be required for all handsets starting January 2024. ISED is updating their online filing system, SpectraWeb, to ensure that when HAC compliance is associated with a certification, the recognized laboratory details can be entered. TCBs need to have RSS-HAC listed on the scope of their associated laboratory by March 2021.

Make sure to include RSS-HAC as part of your laboratory recognition well in advance of the January 2024 deadline if you test cellular handsets, and if you are the TCB laboratory, you will need this added before March 2021.

## Common application issues

**REL Deferral Dates:** When applying for ISED certification for a device, the applicant may request deferral of listing on Canada's Radio Equipment List (REL) and/or Telecommunications Apparatus Registry (TAR). When the CB completes their review, they will submit it to ISED's electronic filing system and enter the requested deferral date.



When requesting a deferral in listing on the REL/TAR, the application must include a cover letter that explicitly references the request for a deferral date and lists the date (note that the CB can enter a different date prior to submitting the application and email ISED asking for a change in date after the application has been submitted). In addition, ISED will only accept deferral dates of up to six months from the date the application is submitted to their system unless very good justification is provided.

**Standards transition dates:** When a standard is revised, there will be a transition period (typically six months) to move from previous version of the standard to the new version. After that transition period, applications for certification must be to the new version. This includes permissive changes and multiple listings. So, if the original testing for those devices was to an older version of the standard, the application needs to include a justification as to why no testing to cover gaps between versions of standards has been included with the application.

**RSS-192 Updates:** If you have devices approved under Issue 3 (or earlier versions) of this standard, they cannot be imported, distributed, leased or sold in Canada after Nov. 14, 2020, unless they meet the requirements in Issue 4. If it meets the requirements of Issue 4 without modifications, then no action is required. If it does not meet Issue 4, then the device may no longer be sold etc. in Canada after Nov. 14 until it is modified and a C2PC (hardware) or C3PC (software) application has been submitted and the new version is listed on the Radio Equipment List (REL).

**RSS-102 Annex A Forms:** New forms are available to allow the inclusion of MPE power density (for portable devices operating above 6 GHz) and nerve stimulation values. When submitting to UL, we have a PDF version and an Excel version of the document that may be helpful.

**Licensed devices sold to general public:** Manufacturers of devices subject to certification and licensing that are sold directly to the public must ensure the channels are locked to prevent transmission. These channels may only be unlocked by an authorized dealer and only on the appropriate channel(s) covered by the license after the user/owner of the device has obtained a license from ISED's Spectrum Operation Office.

## Labeling requirements for small auditory devices

For smaller auditory devices, i.e., those smaller than 1 in./2.5 cm, that would not allow for labeling with the ISED certification number and HVIN, the labeling can be on the case/charging case or, if no case is provided with the device, the labelling information shall be on the product packaging and in the user manual.

## RSS standards – NEW/revised

**Test laboratories:** Don't forget that you must update your scope of accreditation to include the latest version of an existing standard or the new standard within one year of its publication.

Industry Canada's standards (RSS and ICES) and procedures (RSP) can be accessed on their [website](#).

The new standards published in the last 12 months are detailed below. Transition periods to move from previous versions of the standard to the versions listed below is six months from the date of publication unless stated otherwise.

- **RSS-181 Issue 2 (August 2019, amended February 2020)** – Coast and Ship Station Single Sideband Radiotelephone Transmitters and Receivers Operating in the 1,605-28,000 kHz Band
- **RSS-222 Issue 2 (2020-01-24)** – White Space Devices (WSDs)
- **RSS-191 Issue 3 (2008)** – Local Multipoint Communication Systems in the Bands 25.35-28.35 GHz; Point-to-Point and Point-to-Multipoint Broadband Communication Systems in the Bands 24.25-24.45 GHz and 25.05-25.25 GHz; and Point-to-Multipoint Broadband Communications in the Band 38.6-40.0 GHz
- **RSS-310 Issue 5 (2020-01-09)** – License-Exempt Radio Apparatus: Category II Equipment was updated to remove 24-24.25 GHz as this band now falls under RSS 210 (requires certification)
- **RSS 192 (Issue 4)** – Flexible Use Broadband Equipment Operating in the Band 3450 3650 MHz was updated to allow flexible use broadband equipment, i.e., mobile and fixed service, with revisions to limits and measurement methods for non-active and active antenna systems (Active antenna systems require measurement of TRP, not EIRP)
- **RSS 125 (Issue 3)** – Land Mobile and Fixed Radio Transmitters and Receivers, 1.705 to 30.0 MHz, updated to modernize the document structure and harmonize technical requirements with international standards

## RSS standards – in revision

- **RSS 182 (Issue 5)** – Maritime Radio Equipment Operating in the Band 156 162.5 MHz is being updated to bring it into line with the format for the newer standards and to clarify technical parameters
- **RSS 139 (Issue 3)** – Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710 1780 MHz and 2110 2180 MHz is being updated to include the AWS 4 spectrum currently in RSS 170 and look at out-of-band emissions limits and other technical considerations based on market developments
- **RSS 170 (Issue 3)** – Mobile Earth Stations (MESs) and Ancillary Terrestrial Component (ATC) Equipment Operating in the Mobile Satellite Service (MSS) Bands is being updated to move the AWS 4 spectrum out of RSS 170 and into RSS 139

- **RSS 117 (Issue 3)** – Land and Coast Station Transmitters Operating in the Band 200 535 kHz is being revised to address references to certain masks in relation to transmitter output power
- **RSS-222 (Issue 3)** – for TV White Space Devices should be out for consultation later this year with the goal of aligning more with the FCC rules

## ICES standards

All of the ICES standards are being revised to reflect the new structure of these standards that uses ICES-GEN as the central document containing common requirements.

ICES-001 has been updated to Issue 5 and now references the latest (2019) CISPR 11 standard. As the latest CISPR 11 standard no longer includes the limits for induction cooking equipment that are referenced by RSS-216 for Wireless Power Transfer devices, they have been included in this standard with a cross-reference back to RSS-216.

ICES 002 has also been updated to Issue 7 and includes requirements for requirements for plug-in electric vehicles/boats/devices.

ICES 003 Issue 7 is in the pipeline and will reference CSA CISPR 32 instead of CSA CISPR 22. It will still allow the use of ANSI C63.4 measurement methods.

## RF exposure

- **SPR-003 (Issue 1) Upcoming Publication** – Procedures to assess PD for 57 GHz-71 GHz devices using simulations and/or measurements. Awaiting guidance from Health Canada. After publication, ISED will investigate expanding guidance to include all frequencies above 6 GHz.
- **SPR-004 (Issue 1) Upcoming Consultation** – Procedures for validation of Time Averaging Systems (TAS) for certification without needing pre-approval from ISED. This will be different than TAS clause in IEC 62209-1528 but consistent with major TAS implementation which has been evaluated within ISED. After publication, ISED will investigate expanding guidance to include WLAN and other TAS implementation methods. Anticipated initial consultation is mid-fall 2020
- **SPR-002 (Issue 2) In Revision** – Updating procedures to include computational assessment for portable device charging because there are occasions where the existing commercial field probes are too large to capture peak exposure. Additionally, new exposure conditions, e.g., smartphone to accessory charging, will be included. Anticipated initial consultation is late fall 2020.
- **RSS-102 (Issue 6) In Revision** Adopt relevant IEC/IEEE standards, expanding exemption limits for SAR and NS and introducing localized exposure limits for > 6 GHz. Anticipated initial consultation is 2021.

## ISED contacts

ISED can be contacted via the following websites:

- [\*General Inquiries Form for equipment standards or certification issues\*](#)
- [\*Standard Change Request Form for seeking a change to a standard\*](#)
- [\*ISED documents including RSS's and ICES standards\*](#)

## **Q&A forum**

Q1: What is the status of a Canada-U.K. MRA to address a post Brexit U.K.?

A1: At this time, negotiations are ongoing.

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## FCC

### Equipment Authorization System (EAS) Overhaul

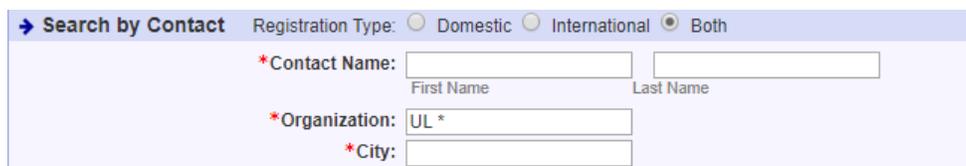
The EAS is undergoing a large structural overhaul that will require TCBCs and other interacting with the system to modify their procedures. Rollout of this new system has been delayed but expected to start in the next six to eight months.

To prepare for this, it is very important that grantees (manufacturers) and agents ensure that key staff are registered with the FCC CORES system. When TCBCs are using the new system, they will not be able to complete electronic filing unless the contacts for agent and manufacturer have been registered.

The contacts must obtain usernames (based on email address) and associate those username accounts with the applicable FRN for the company (companies) they represent at [www.fcc.gov/CORES/](http://www.fcc.gov/CORES/). The process to get a username account is very quick.

The association process to link a username with an FRN can be done by the username that has CORES/FRN administrative rights for the FRN (in this case they just need to know the usernames to be associated with their FRN). Alternatively an individual user can request association with a specific FRN, and then the FRN administrator is notified by email that they need to validate the request.

 Now is the time to make sure you know who your FRN administrator is and ensure that they are aware of their responsibilities to link/associate usernames with your FRN. If this is not done now, then there is a strong probability of delays in getting grants issued when the new system comes online. Make sure your company has an FRN. Manufacturers/grantees already have to have one to be able to submit a filing for equipment certification, but many non-U.S. laboratories may not. To check your FRN information, go to the CORES site use the [advanced search tool](#). Strongly recommend you use a wildcard "\*" to make sure you find your company – see my search entry of **UL \***:



The screenshot shows a search interface with the following elements:

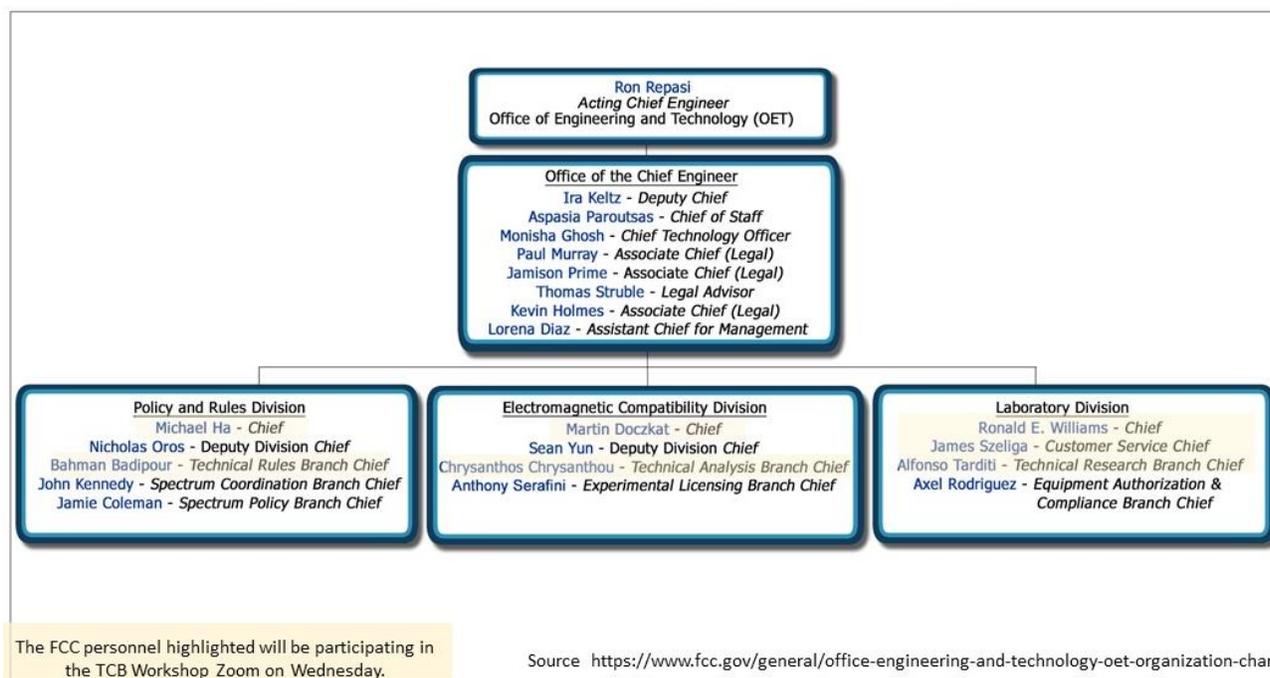
- Registration Type:  Domestic  International  Both
- \*Contact Name:  (with sub-labels First Name and Last Name)
- \*Organization:
- \*City:

It was not clear if an agent needed to be associated with the FRN for the grantee or just registered in the system. Hopefully this will be cleared up in the near future.

## KDB and General Updates

Several of the KDB publications have been updated.

### Office of Engineering and Technology (OET) - Organization Chart



- **285076 D03 HAC FAQ v01r03** – Updated the interim procedure for evaluating OTT/Vo5GNR.
- **388624 D02 Pre-Approval Guidance List v16r10.** – Added devices that use the new MIMO antenna gain measurement procedure to determine directional gain.
- **662911 D03 MIMO Antenna Gain Measurement v01** – New MIMO antenna gain measurement procedure to determine directional gain rather than relying on the theoretical calculations based on the individual antenna gains.
- **680106 (Wireless Power Transfer)** – See details in the Wireless Power Transfer (WPT) section.
- **996369 D04 Module Integration Guide V02** – New draft posted to clarify that the frequency range to test for the composite digital device (host system plus module) is the frequency range specified in 15.33(b) based on the highest frequency generated in the complete system, including the modular transmitter.

## Administrative Topics

Several topics were discussed, including SDoC, the requirements in FCC parts 2.803 and 2.805 related to importation, marketing and operation of devices under the scope of FCC's rules prior to an equipment authorization being issued and the PAG process. Details are too long to summarize here.

## **Confidentiality of Application Exhibits**

Jim Szeliga (FCC) confirmed that short term confidentiality can only be held for 180 days after the grant has been issued; it cannot be extended beyond that. If a manufacturer needs to keep the information in those short-term confidential exhibits out of the public record, the only option is to ask for the grant to be dismissed and then re-apply for certification later.

Documents that were in the public domain on the FCC site may be available (and typically are available) through third-party websites that automatically download content posted on the FCC site within seconds of the grant being issued. If documents are released to the public through the FCC site, i.e., confidentiality was not requested at the time the grant was issued, a KDB inquiry is required to have the documents' status set to confidential. A manufacturer must provide a cover letter requesting the confidentiality status and that letter must include an acknowledgment that they are aware that, even after the documents are no longer in the public domain on the FCC site, they may be available on third-party websites.

To allow some exhibits such as user manuals or internal photographs to be held confidential, an example of the NDA that is in place between the equipment manufacturer and the professional installers and users of the device must be provided. If the NDA requirement cannot be met (or the circuit board is not encased in epoxy), then a PAG is required before short term confidentiality can be approved for the user manual or internal photographs. Internal photographs may also be held confidential without a PAG if the circuit board is set in epoxy.

Refer to [KDB 726920](#) for more information on confidentiality. To hold anything confidential beyond what is allowed in the KDB will require PAG approval.

## **Part 15 updates**

**Part 15.255** allows use of the 57-64 GHz frequency band for fixed field disturbance sensors (“fixed” meaning devices that are installed onto permanent structures such as the walls of buildings or antenna towers). Use of the band for portable or mobile (“mobile” meaning devices that are not installed/mounted onto permanent structures) is only allowed for short range interactive motion sensing devices. Unfortunately, nowhere in either Part 2 or Part 15 of the rules is “interactive motion sensing” defined, which has led to multiple requests for waivers for devices to be approved under this category. We have recommended that the FCC put 15.255 devices onto the PAG list until clarification on what the intent/definition of “interactive motion sensing” has been established.

**Part 15.258** was adopted in August 2020 and allows for unlicensed devices in the 116-123 GHz, 174.8-182 GHz, 185-190 GHz and 244-246 GHz frequency ranges. They allow for an EIRP of 40 dBm (average, peak limited to 43dBm), reduced EIRP limits when the bandwidth is below 100 MHz and higher EIRP limits for point-to-point transmitters. Frequency stability requirements are included in this rule part. The best measurement methods are still to be determined.

## 6 GHz FCC

The FCC adopted new rules that added four new bands under Part 15 E covering the frequency range 5.925 to 7.125 GHz. All four bands are allowed for indoor use, and two bands allow for higher power and outdoor use but also require use of a frequency coordinating system (Automated Frequency Coordination, or AFC) that access points must register with to determine channel(s) that are open and available for use.

Certification for devices through permit, but ask guidance has been opened up for the indoor<sup>4</sup> use provided that the FCC draft guidance is followed. APs and subordinate<sup>5</sup> devices must be AC powered and cannot have a weatherized enclosure and cannot be used in vehicles. Client and AP devices cannot be used to control/communicate with drones and must have integrated antennas. Clients can only operate under the control of an AP or subordinate device and cannot support client-to-client operations, i.e., no Wi-Fi direct or similar peer-to-peer protocol.

The test procedures mostly follow the existing procedures for U-NII devices (ANSI C63.10), but some additional requirements and differences do exist:

1. Channel mask requirement
2. Out of band spurious limit for emissions outside of restricted bands is -27dBm/MHz eirp rms and -7 dBm/MHz peak. The rules for the 5 GHz U-NII bands specify a peak limit of -27 dBm/MHz.
3. Devices must employ a contention-based protocol (listen before talk) that prevents the device from transmitting until the channel is clear. The draft guidance has a detailed test procedure.

Tables in the draft [KDB 987594](#) provide details on the documentation that needs to be submitted to support the applications (section D of the publication)

## Data Referencing FCC

The FCC spent some time discussing KDB Publication 484596 which describes the conditions under which test data for a parent model can be used to support the certification of a variant model. The KDB limits the reuse to just the EMC data/RF exposure measurement data. HAC testing cannot be leveraged and requires that the variant and parent models can share test data when:

- Device materials, form factor and PCB layout are the same.
- The only differences between the reference model (the model for which testing is performed in full) and variant allowed under the KDB are depopulation of components.
- The reference model needs to be the most-populated model.
- Data reuse is only valid for bands/modes where the power values are the same.
- Spot check data is included to demonstrate that the reference model data is representative of the variant model.

Reuse of SAR test data, or for instances where the general reuse conditions detailed in the KDB cannot be met, may be allowed on a case-by-case basis. The manufacturer must have the test plan agreed upon by OET via KDB

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<sup>4</sup> Outdoor use cannot be used until the AFC has been established.

<sup>5</sup> Subordinate devices operate under the control of an AP and may have client devices associated with them. Examples of devices are Wi-Fi extenders and mesh network infrastructure devices.

inquiry, and that plan has to include the proposed spot checks to be performed and the metrics that would determine if the spot check data allows for reuse or would necessitate the need for additional testing for the variant model.

## Wireless Power Transfer (WPT)

In the first presentation on WPT, the FCC released an updated draft version of *KDB 680106* to further relax the conditions under which a PAG would be required as follows:

Current edition	Proposed
Power transfer frequency < 1MHz	No change
Power per coil < 15W	No change
The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.	The system may consist of more than one source primary coils charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.
Client device is placed directly in contact with the transmitter	No change
Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	No change
Aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.	The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

The FCC also announced requirements for the peak E-field (83 V/m) and H-field (90 A/m) from WPT devices operating below 100kHz

WPT devices are considered as being classified as portable chargers because they can come within 20 cm of people. In a previous workshop, the testing for vehicular WPT devices, that operated in accordance with all other requirements that would not necessitate a KDB inquiry (see table above) would have the KDB requirement waived if the measured fields were below 10% of the limits at the required test distance. They relaxed the 10% requirement to be 100% of the limit provided that the device operates at 100% duty cycle.

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6 Similar to the requirements ISED use for Nerve Stimulation, except limits are different and ISED’s requirements apply below 10MHz.

In the RF exposure presentation, Jake Novicky (FCC) provided detailed guidance on test methods for multi-coil WPT devices that have more than four charging coils, the coils are equally spaced and do not overlap, operate at less than 15 W per coil and cannot be daisy-chained together with another WPT device<sup>7</sup>. Refer to the presentation for full details.

## Spectrum Allocation

Bahman Badipour from the FCC's Technical Rules Branch discussed recent proposals for changes to Parts 15 and 18, and others.

On the subject of expansion of 5G, frequency spectrum moves to add the following are underway:

- 3.45-3.55 GHz band (licensed) – see also [WT Docket No. 19-348](#) for latest proposed rules and [FCC-20-138A1.pdf](#) for latest rules
- 3.5 GHz and 3.7 GHz bands (licensed - GN Docket No. 19-348 and 18-122)
- Changes to the 600 MHz, 80MHz, and 900 MHz bands (licensed)
- Next generation of Wi-Fi in the 5.9 GHz (ET Docket No. 19 138), 6 GHz (ET Docket No. 18-295, with new rules already published), and above 95 GHz band (ET Docket No. 18-21)

Other changes include modifications to the requirements for white space devices (ET Docket No. 20 36 proposes increased output power, removal of height limitations).

The presentation looked at recent waiver requests. It is worth a review if only to see what companies are trying to do with the existing rules.

## ANSI C63 Standards update

The latest edition of C63.4 needs some updates before moving forward with final voting.

C63.10 is close to being published.

C63.26 is still under revision. Main work remaining is with the mmWave-related test procedures and adopting other types of test sites (compact antenna test ranges – CATR and reverberation chambers) for the TRP and EIRP measurements.

C63.29 for lighting devices is getting close to completion and the main issue is related to the testing of dimmer switches.

C63.30 will cover WPT devices for both small devices and vehicle chargers. The standard will also introduce the use of the LLAS and is hoping to develop correction between the OFS and alternative test sites so that testing can be done on an alternative test site without requiring a comparison to the OFS. This standard is in final draft and waiting for balloting.

C63.31 will cover ISM equipment and is mainly being written to replace MP-5 with updated equipment and test procedures for devices not covered by C63.29 and C63.30. Test site requirements and in-situ testing have been addressed, and work is now concentrating on test set-up and test methods.

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<sup>7</sup> If these conditions are not met then – correctly guessed – KDB guidance is needed.

C63.25.1 was published in March 2019 and introduces the idea of time domain site VSWR to replace the CISPR SVSWR method for site validation over the frequency range 1-18 GHz. A petition for the FCC to adopt this standard is currently pending. There will be several follow up standards. In the series will be:

- C63.25.2 applicable over 30-1000 MHz – in progress
- C63.25.3 applicable over 9 kHz-30 MHz
- C63.25.4 applicable over 18-40 GHz

C63.19-2019 has been published. It replaces the acoustic and inductive (M/T) ratings previously used to quantify Hearing Aid Compatibility (HAC), introduces a new volume control requirement consistent with a similar landline requirement specified in ANSI/TIA-5050, and expands the applicable frequency range. In January, the FCC Wireless Telecommunications Bureau released an *NPRM* proposing to incorporate this new version into FCC Wireless HAC rules and make it exclusive. There would be a two-year transition period from the C63.19-2011 standard to the 2019 version and a corresponding extension to the current volume control deadline (March 1, 2021) to coincide with recognition of C63.19- 2019. The goal is to release the report and order to adopt the proposed rules before the March 1, 2021, deadline for HAC to include volume control.

## RF Exposure Procedures FCC

### ***5G and RF Exposure Policies***

The FCC discussed conditions under which inter-band and intra-band 5G NR operations that use NSA (non-stand-alone, aka EN-DC and require an LTE anchor channel) could have a PAG waived provided that the laboratory has a pre-TCB KDB approval for their test plan. If the individual SAR values for the 5G NR or LTE anchor channels exceed 0.8 W/Kg or the total SAR (sum SAR) value exceeds 1.45 W/Kg, then PAG is required.

The general guidance is to measure the SAR for the LTE and 5G NR transmitters separately (stand-alone SAR values) and then sum the values for the applicable combinations of LTE and 5G NR bands for all of the applicable RF exposure conditions (head/body/hot spot, etc.). The test reduction procedures used for LTE (selection of RB allocations, channel bandwidths, etc.) should also be followed for the 5G NR.

For devices that support antenna tuning for 5G NR, especially for NSA modes, it is necessary to make measurements in the factory test modes which may or may not allow the tuning state to be automatically set. In this case, the FCC would allow the default tuning state for LTE to be used to evaluate the 5G NR SAR value and then the other tuning states checked using the single point measurements (refer to April 2019 guidance for general antenna tuning SAR measurement methods).

Additional material on various scenarios for test reduction for 5G NR were also presented.

## ***SAR for 6GHz Wi-Fi***

The FCC rules allow for SAR measurements up to 6 GHz and then require a change in assessment method to power density at frequencies above 6 GHz. This poses an issue for the latest 6GHz Wi-Fi bands that straddle 6 GHz.

Interim procedures will allow for SAR measurements<sup>8</sup> using the 2020 version of IEC 62209-1528 and also provide the estimated absorbed (epithelial) power density (for reference purposes only, not specifically for compliance) and estimated incident PD derived from measured SAR. They evaluate the incident power density using mmWave near-field probe test methods and report the power density adjusted to account for measurement uncertainty > 30%. This data should be submitted as part of either a pre-PAG manufacturer/laboratory KDB inquiry or as part of the TCB PAG inquiry. Based on results FCC may request additional testing.

As the 6 GHz bands cover over 100 MHz of spectrum the number of channels to evaluate for SAR per KDB 447498, a total of 10 channels should be tested, however, the FCC will allow five channels to be tested. The general test reduction methods of KDB 248227 should be used to determine the operating bandwidths to test.

## ***RFID/barcode Scanners***

The form factor for these devices can make it difficult to measure SAR at the position where the hand would be holding the device. If it can be demonstrated that the transmitting antenna is highly directional and the main direction is away from the hand, i.e., points toward the front of the scanner, then SAR may be measured from the front of the scanner using the separation distance between antenna and hand (it is assumed antenna is at the front of the device). The SAR report must clearly explain what was done, i.e., reference the workshop material, include the directivity plot. Steve Hauswirth (UL) clarified with the FCC that the directivity plot needs to be made of the antenna installed in the device.

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<sup>8</sup> Note that IEC 62209 specifies a maximum probe diameter of  $\lambda/3$  and even the SPEAG "EX" probe (with tip diameter of 2.5mm) is larger than  $\lambda/3$  at 7 GHz. We have submitted a KDB to the FCC asking for guidance on this.

## RF Exposure

### ***FCC 19-126 Report and Order***

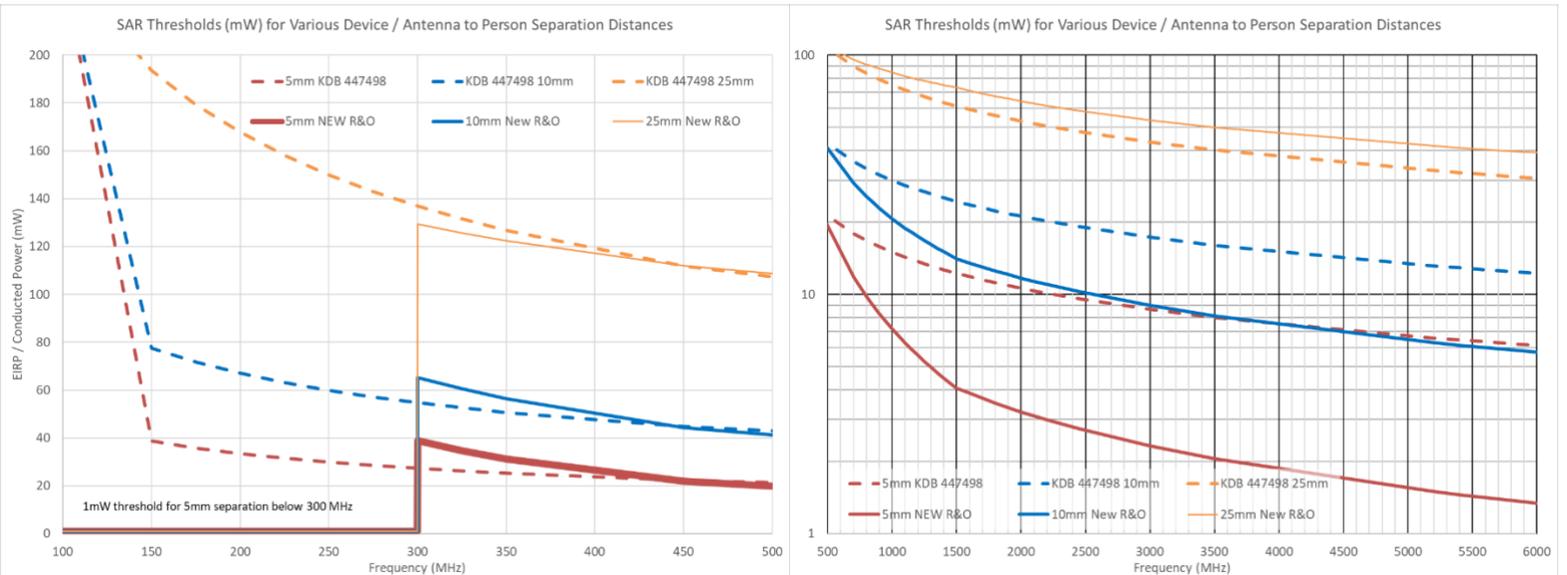
 On April 1, 2020, the 19-126 report and order, which modifies several key elements related to the evaluation of RF exposure for all radio frequency devices, was published and the online FCC rules now include these changes. These are the most significant impacts of these changes:

1. Effective now – the rules allow more options for computational tools and require validation of the computational software and models.
2. Removed the 5 cm evaluation distance for portable devices operating above 6 GHz. Portable devices operating above 6 GHz require a PAG, and as part of the PAG approval, the FCC requires assessment at distances consistent with actual use, i.e., 5 mm for body-worn devices, so this has effectively been required for the last one to two years.
3. Modified the categorical exclusions. Under the old rules, many devices were exempt from any sort of RF exposure evaluation. With the change in rules, all devices will need an assessment for RF exposure, even if just to show an exemption from measurement. Plots showing the new thresholds versus old thresholds are provided on the next page. The process to determine an effective date for these thresholds has started, and the FCC expected this could happen within the next six months. Significant updates to the primary RF exposure KDB publication KDB 447498 will be needed to help us understand how the new rules will be implemented.

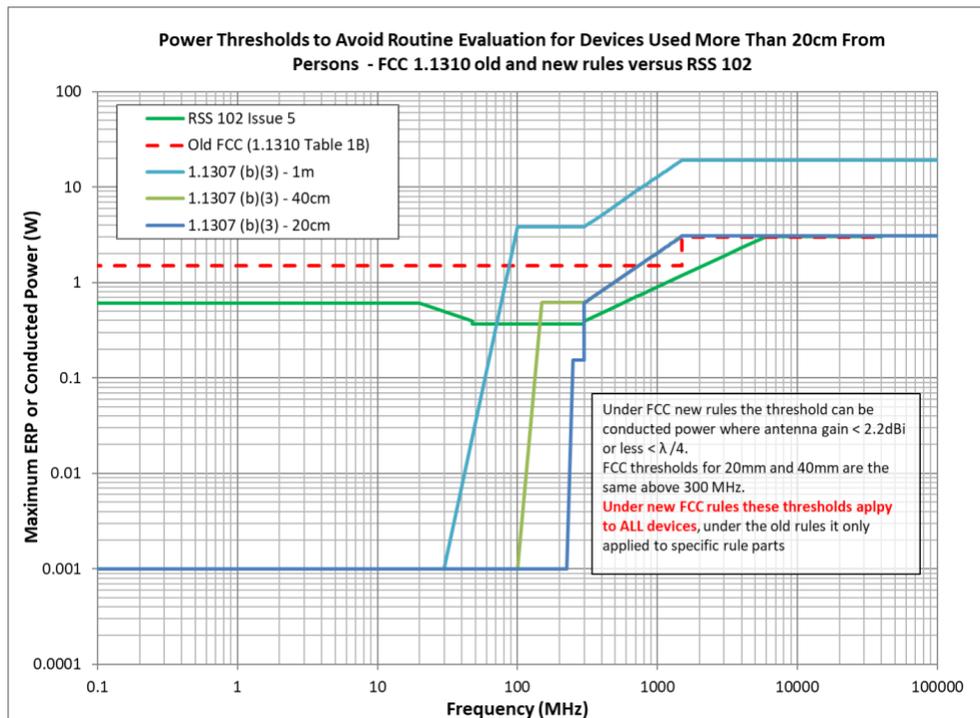
The new rules do not change the SAR and MPE limits and the FCC noted that included in the Federal Register is confirmation that the pinnae (outer ears) remain subject to extremity SAR limits despite a petition to change that classification.

Notable devices that will be affected:

- All Part 15 devices operating below 30 MHz, e.g., 13.56 MHz NFC and other RFID devices. Not only was RF exposure not addressed before (except in WPT devices), but the 1 mW threshold may be difficult to apply because conducted power for these devices is never measured and chipset specification sheets often show a significantly higher power than 1 mW supplied to the antenna. This may mean additional testing for these devices.
- All Part 15 field strength devices. Currently no RF exposure assessment is performed for these devices, but under these new rules, the certification application will need to include an assessment to show the ERP/conducted power is below the threshold. For multitransmitter devices, guidance will be needed to determine when measurement is required to show that any contribution to the overall RF exposure from the part 15 transmitter would be negligible.
- The new thresholds that would require SAR testing are significantly lower (2 mW versus 9.5 mW at 2.4 GHz) and based on the higher of conducted power and ERP (previously only determined based on conducted power). This will impact many Bluetooth devices.



Portable device SAR exemption thresholds



Mobile dSAR exemption thresholds

In the same release as the new rules described in the previous section, the Federal Register included a NPRM to address the following RF exposure issues:

- Extending exposure limits below 100 kHz and above 100 GHz



- Device-based time-averaging for exposure compliance
- Spectrum, rule part and RF exposure considerations for wireless power transfer (WPT) devices, including distance charging

## Time Averaging SARhich

This was a very good overview of Qualcomm's SmartTransmit technology that dynamically controls output power to limit the average power over a specific time period (varies with frequency range for the FCC, 360s for Canada). This allows the device to transmit at higher powers for short periods of time and reduce power when the device transmits for longer periods of time within the averaging window. This ensures compliance with SAR and Power Density (FR-2 bands) requirements without having to always operate at a reduced power.

In the chat discussions, the following conversations were noted:

- Time average period is not the same between the FCC and ISED Canada. ISED Canada has a longer window (360s) whereas the FCC is around 60 to 100s.
- TDD modes in SAR reports need to clearly distinguish frame averaged and burst averaged power.
- To make testing more streamlined, would it be acceptable to validate the averaging over the shortest time window (100s or 60s) versus the longer windows (360s)? ISED requires 360s and does not accept the shorter window. Based on discussions with ISED and with Health Canada, they do not believe there is justification for the 100s time averaging window, and 360s is more appropriate.

## ISED versus FCC Rules

If you want a copy of this, please ask.

## 6GHz in Europe

Broadcom gave a great presentation on the state of 6 GHz frequency allocation and measurement standards in Europe.