IEEE 802.18

Radio Regulatory-TAG

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| Radio Regulatory Technical Advisory Group Minutes | | | |
| Date: 10-17mar22 | | | |
| Name | Affiliation | Address | Email |
|  |  |  |  |
| Author and Officer presiding: | | | |
| Jay Holcomb,  Chair, RR-TAG | Itron | Liberty Lake, (Spokane) WA | jholcomb@ieee.org |

Co-Vice-chairs are [Stuart Kerry (OK-Brit/Self)](mailto:stuart@ok-brit.com) and [Al Petrick (Skyworks Solutions)](mailto:apetrick@ieee.org)

Abstract

Minutes of the IEEE 802 RR-TAG teleconference

These are the Minutes of the IEEE 802 RR-TAG teleconference Thursday, 10-17mar22

1. Chair presents slide 2, Registration for the March ‘22 IEEE 802 electronic plenary session
   1. This meeting is part of IEEE 802 electronic January 2022 plenary session
   2. You must pay the registration fee in order to attend
   3. If you have not already done so, you can register at: [**https://cvent.me/M7g7G3**](https://cvent.me/M7g7G3)
   4. Late Registration: **After 25 February 2022 \* $US** 800**.00 for all attendees**
   5. If you do not intend to register for this session you must leave this meeting and, if you have logged attendance on IMAT, please email the 802.18 chair or a vice chair to have your attendance cancelled
   6. At conclusion of each of the 802.18 calls, the Webex log and IMAT will be reviewed.
   7. No payment, become dead beat and lose voting rights in all groups, after 60-day grace.
2. Chair called the meeting to order at 15:02 et

**note:** all 6 nearly voters were in attendance of the first meeting, therefore, now 46 voters (8 on LMSC) and 0 nearly voters.

1. Chair presents slides 3 – 8 of 802.18-22/0027r01, the call to order and administrative items
   1. Includes IEEE 802 meeting and participant’s guidelines and requirements.
2. Chair presents slides 8, the agenda:
   1. Call to Order
      1. Attendance is on IMAT (w/VC & webex checks)
      2. This session does count for participation credit. Need 75%.
      3. Remember to mute when not speaking, thanks.
      4. Please request Q in the chat window, thanks.
   2. Administrative items
      1. Someone to take some notes, Peter E
      2. Attendance & monitor chat window, Stuart K
   3. Approve agenda, last minutes then administration items
   4. **Approve ongoing teleconferences and then officer elections**
   5. Discussion items for both weeks
      1. EU Items
      2. Other Regions Items
      3. ITU-R Items
      4. General Discussion Items
   6. Actions required.

      2. Anything new today
      3. ongoing: WRC-23 AI Viewpoints & Freq. table fill in
   7. AOB
   8. Recess
3. Chair presents slides 9 - 17 Administrative – Motions and more
   1. **Motion: To approve the agenda as presented on previous slide**

Moved by: Stuart Kerry (OK-Brit, self)

Seconded by: Ian Sherlock (Texas Instruments)

Discussion? None

Vote: Approved by unanimous consent

* 1. **Motion:** To approve the minutes in document <https://mentor.ieee.org/802.18/dcn/22/18-22-0007-02-0000-minutes-electronic-wireles-interim-20-27jan22-rr-tag-pty.docx> 09-Feb-2022 08:24:52 ET, with editorial privilege for the 802.18 chair.

Moved by: Al Petrick (Skyworks Solutions)

Seconded by: Jim Lansford (Qualcomm)

Discussion? None

Vote: Approved by unanimous consent

* 1. **Teleconferences**
     1. **Motion: The 802.18 Chair or Chair designee is directed to conduct, as necessary, teleconferences on Thursdays at 15:00 ET (for 55mins) through 22 Sept 2022**

Moved by: Stuart Kerry (OK-Brit, self)

* + - 1. Seconded by: Andy Scott (NCTA)
      2. Discussion? None
      3. Passed by Unanimous Consent
      4. Motion passed, \_33\_ voters with \_35\_attendees
  1. **Administrative–moving forward**
     1. **For March 2022 Plenary (was Orlando)**
        1. Decision point was on LMSC/EC call Tuesday/07dec21 and Plenary will stay electronic:
        2. **However, contract negotiations on the March 2022 cancellation will result in a significant penalty fee not anticipated on December 7th, 2021.**
        3. **Registration for the March 2022 Plenary was suspended immediately until the new Fee Structure for the plenary to address the high penalty fee was determined this week at the 04jan21 LMSC/EC call.**
           1. $400 until Friday, January 28, 2022 (fully refundable. until January 28th)
           2. $600 until Friday, February 25, 2022 (refundable with cancellation fee. January 28th to February 25th)
           3. **$800 after Friday, February 25, 2022 (non-refundable. after February 25th)**
           4. **note:** Those individuals who had previously registered will be contacted directly by the IEEE 802 EC Executive Secretary for further instructions.
        4. Plenary info: <http://802world.org/plenary/>
        5. Face to Face Registration Website: <https://cvent.me/yG5GY2>
        6. Plenary dates to be 04-18 March (Avoids conflict with IEEE-SA Meetings March 22-24.)
           1. .18 will be our normal weekly times and call-in, Thursday’s 10th and 17th March2022.
     2. **For the 8-13 May 2022 Wireless Interim in Warsaw, Poland, the WCSC voted (02feb22) to head in the direction of mixed-mode (9-1-0) and will continue as such from meeting on 02mar22.**
        1. The fees were also voted on at $950/$1200/$1450 with cut off dates of 08Apr/29Apr. Same fee whether in person or remote.
        2. Yes, what is going on in eastern Europe was discussed and the team is preparing what they can if the Interim has to go to all virtual later.
        3. May look at a poll during next week’s call, with the 2 questions, if f2f would you attend, if mixed mode how would you attend.
     3. For the **July 2022 Plenary in Montreal, Canada,** will start an epoll for this plenary, with the same 2 questions like in the past, if in-person would you come and if mixed-mode, how would you attend? epoll will close next Wednesday, 16mar22 et.
  2. **View of 802 Treasury, Starting to turn around:**
     1. <https://mentor.ieee.org/802-ec/dcn/22/ec-22-0059-00-00EC-treasurer-opening-summary-for-wgs.pptx>
     2. **2021 institution of fees has stopped the bleeding**
        1. Year-end 2021 for session expenses is slightly positive
     3. **March 2022 meeting looks successful – 884 registered (sounds like >900 now)** 
        1. Will generate (a needed) surplus
     4. **802 cash reserves at critical level (equal ~1 meeting cancellation) going into March 2022**
        1. Cash reserves less critical but still concerning even after March 2022 success
        2. Budget and plan for July 2022 meeting (with mixed-mode support) fits within budget, continues return to more normal operating reserves
     5. **802 Participants have largely been compliant with meeting fees** 
        1. > 1000 participants per meeting x 3 meetings, only 9 unpaid attendees
  3. **LMSC P&P sections 3.1: 802 EC election/appointments**
     1. All 802 executive committee members are elected or appointed and confirmed at the first Plenary session of each even numbered year.
  4. **For anyone to be considered for the 802.18 Chair, Vice Chairs or the appointed positions**
     1. ***Please send nominations or self nominations to the .18 Chair before Wednesday 02 March 2022 - end of day aoe.***
     2. 802.18 elections will be at the first 802.18 meeting of the Plenary, 10mar22.
  5. **The .18 Chair position nominees: Tuncer Baykas and Edward Au**
  6. **The .18 Vice-Chairs nominees: Stuart Kerry and Al Petrick (having 2 VCs is acceptable, will vote on each person)**
  7. **Will give each of the 4 candidates 2 mins to express their views on what they can do for .18.**
  8. **All potential EC members, Chair and Vice Chairs**
     1. Please remember to submit your letters of endorsement and disclosure of affiliation to the IEEE 802 Recording Secretary, John D’Ambrosia, as soon as possible, but no later than the call to order of the March 2022 closing LMSC meeting. **All have turned in their letters.**
     2. For Chair, Vice Chair and Secretary, you need to be a member of the IEEE SA
     3. The TAG/WG chair & vice chairs are subject to confirmation by IEEE 802 EC.
  9. **Responsibilities / expectations for all offices are in the back up slides in this slide deck**

1. **Administrative–election for 802.18 Chair (2022-2024)**
   1. Will use WebEx polling (Chair will not vote)
   2. **Voting members only, please.**
   3. Motion: To approve Tuncer Baykas (Kadir Has University) or Edward Au (Huawei Technologies Co., Ltd) as Chair of the RR-TAG (IEEE 802.18) for the next two years, through the first IEEE 802 Plenary of 2024.
      1. **Moved by:** Stuart Kerry (OK-Brit, self)
      2. **Seconded by:** Ian Sherlock (Texas Instruments)
      3. **Discussion?** If a tie, will have a runoff (another vote)
      4. **Vote: \_\_8\_\_\_ A. Tuncer Baykas (Kadir Has University)**
      5. **\_20\_\_\_\_ B. Edward Au (Huawei Technologies Co., Ltd)**
      6. **\_\_3\_\_\_ C. abstain**
      7. **\_\_5\_\_\_ did not vote**
      8. (\_34\_ voters present)
      9. Total # present at time of vote: \_37\_
   4. Final results are dependent on voting member audit and then the LMSC (EC) confirmation at the March 2022 Plenary LMSC(EC) closing meeting Friday 18mar22.
2. **Administrative–election for 802.18 Vice Chair (2022-2024)**
   1. Will use WebEx polling (Chair will not vote)
   2. **Voting members only, please.**
   3. **Motion:** To approve Stuart Kerry (OK-Brit / self ) as Vice-Chair of the RR-TAG (IEEE 802.18) for the next two years, through the first IEEE 802 Plenary of 2024.
      1. **Moved by:** Andy Scott (NCTA)
      2. **Seconded by:**  Mike Lynch (MJLynch Assoc.)
      3. **Discussion?** None
      4. **Vote: \_28\_Y / \_0\_\_N / \_0\_\_A / \_8\_dnv**
         1. note: Webex had 27/9, though one member’s internet drop, needed to add that Y vote.
      5. (\_34\_ voters present)
      6. Total # present at time of vote: \_37\_
   4. Final results are dependent on voting member audit and then the LMSC (EC) confirmation at the March 2022 Plenary LMSC(EC) closing meeting Friday 18mar22.
3. **Administrative–election for 802.18 Vice Chair (2022-2024)**
   1. Will use WebEx polling (Chair will not vote))
   2. **Voting members only, please.**
   3. **Motion:** To approve Al Petrick (Skyworks Solutions) as Vice-Chair of the RR-TAG (IEEE 802.18) for the next two years, through the first IEEE 802 Plenary of 2024.
      1. **Moved by:** Stuart Kerry (OK-Brit, self)
      2. **Seconded by:** Lei Wang (Futurewei)
      3. **Discussion?** None
      4. **Vote: \_29\_Y / \_0\_\_N / \_0\_\_A / \_7\_dnv**
      5. (\_34\_ voters present)
      6. Total # present at time of vote: \_37\_
   4. Final results are dependent on voting member audit and then the LMSC (EC) confirmation at the March 2022 Plenary LMSC(EC) closing meeting Friday 18mar22.
4. Chair presents slides 18-19, **EU items to share**
   1. General EU info: [<ojeu>](https://eur-lex.europa.eu/oj/direct-access.html) [<HStds>](https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/) <https://www.etsi.org/deliver/etsi_en/>
      1. Remember–BRAN documents can be found in 802.11 private area documents (daily refresh)
         1. for reference, ad hoc meetings can make decisions, rapporteur meetings cannot.
   2. **ETSI –** [<BRAN>](https://portal.etsi.org/tb.aspx?tbid=287&SubTB=287) **next meeting #114, 03-10jun22 (Sophia-Antipolis, FR)**
      1. **In between ad hocs at this point.**
      3. **24feb:** 1 ad hoc so far on TS 103 754 mesh AP performance testing was approved. Next is ETSI helpdesk will review then will be published.
      4. EN 303 687 (6GHz) ETSI helpdesk is reviewing the draft, then after that to the EC for assessment. as reported, it may not be assessed, then if not it will move on to ENAP for 90 days.
      5. **More ad hocs will be coming, 21mar–112e on TR 103 721 (mitigation at 5.8 GHz;**
      6. **21mar–113e on EN 303 687 (6 GHz); 22mar–113d on EN 303 722 (60 GHz);**
      7. **31mar–113b on TS 103 754 (mesh AP performance testing)**
   3. **ETSI – ERM** [<TG-UWB>](https://portal.etsi.org/tb.aspx?tbid=729&SubTB=729)  **next meeting #61, 03-05may22 (t.b.d , FR)**
   4. **CEPT –** [**<ECC>**](https://cept.org/ecc/groups/ecc/client/introduction/) **(and general items) next call, #59 28jun-01jul22, where tbd**
   5. **CEPT – ECC** [**<SE45>**](https://cept.org/ecc/groups/ecc/wg-se/se-45/client/introduction/) **(5925-7125 MHz) next meeting #16, 29jun-01jul22, hybrid meeting** 
      1. **From 03-04mar #15:** SE45\_03 6GHz OOB emissions limits below 5935MHz: To further study OOB emissions from Very Low Power (VLP) WAS/RLAN devices operating in the band 5945–6425 MHz to protect CBTC systems that operate in the band 5915-5935 MHz.
         1. SE45\_04 WAS/RLAN technical studies on 6425-7125 MHz,
      2. **03mar:** Agenda is on SE45\_03 CBTC, communications-based train control, train to track side.
         1. There is SE45\_04 is on the 6425-7125 MHz, Std. Power., looks like another update to move back SE45, more info will be coming in the next couple of days.
   6. **CEPT – ECC** [**<WGFM>**](https://cept.org/ecc/groups/ecc/wg-fm/client/introduction/)  **next meeting #102 06-10jun22, where tbd**
   7. **CEPT** [**–**](https://cept.org/ecc/groups/ecc/wg-fm/srdmg/client/meeting-calendar/) **ECC** [**<SRDMG>**](https://cept.org/ecc/groups/ecc/wg-fm/srdmg/client/meeting-calendar/)  **next meeting 28Mar web meeting then #85 20-21apr22 ECO office** 
      1. **For 28mar22 -** Higher power Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) including the use of equipment with 1 to 4 W e.i.r.p. in the 5945-6425 MHz frequency band using a dynamic spectrum usage coordination
   8. nice site: CEPT 6 GHz status across the countries: <https://docdb.cept.org/implementation/16737>
      1. 16dec: showing 3 -4 countries note, updating this site is very slow, beware.
5. Chair presents slides 20-21, **Other regions (outside EU-Stds and USA), items to share**
   1. **Japan MIC began a consultation on March 3 that asks for public opinions on its recommendation on technical conditions for 6 GHz WLAN.**
      1. Selected findings are summarized as follows:
         1. Frequency band: 5925 ~ 6425 MHz
         2. Modes of operation: low power indoor, very low power
         3. EIRP (antenna power) should be 200 mW or less in LPI mode and 25 mW or less in VLP mode.
         4. Many technical conditions of 6 GHz LPI will follow those of 5 GHz
         5. For 6425 ~ 7125 MHz, further coexistence studies are required.
      2. For details, please refer to the official website at:
      3. <https://www.soumu.go.jp/menu_news/s-news/01kiban12_02000136.html>
      4. The comment submission (in Japanese) deadline is April 1, 2022.
   2. **UK-Ofcom Consultation on upper 6GHz**
      1. [https://www.ofcom.org.uk/consultations-and-statements/category-2/spectrum-sharing-upper-6-ghz-b](https://mentor.ieee.org/802.18/dcn/22/18-22-0029-00-0000-ofcom-consultation-on-spectrum-sharing-6ghz.zip)
      2. <https://mentor.ieee.org/802.18/dcn/22/18-22-0029-00-0000-ofcom-consultation-on-spectrum-sharing-6ghz.zip>
      3. The consultation proposes to add upper 6 GHz, specifically 6425 MHz to 7070 MHz, to shared licences for local, low-power indoor use. (not a discussion on license-exempt)
      4. The comment submission deadline is April 11, 2022 (so out of .18 by 24March22)
      5. Have had an input on a possible response on how to support home network environment with shared access.
      6. With limited time today, the chair asked for list server editing once the draft response is uploaded. More next week then.
   3. **Canada-ISED has two consultations started.** 
      1. Comments due on both, 29April 22 (so out of.18 by 14April22).
      2. One on > 95 GHz
      3. <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11767.html>
      4. Specific change to the spectrum utilization for spectrum above 95 GHz are discussed, specifically, "to allow the use of licence-exempt devices in the 116-122.25 GHz, 122.25-123 GHz, 174.8-182 GHz, 185-190 GHz and 244-246 GHz bands on a no-protection, no-interference basis
      5. Specific technical conditions, which are similar to those of 57-71 GHz, are proposed
      6. License exempt and backhaul are talked to.
      7. One on 5.9 GHz;
      8. [https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11766.html](https://urldefense.com/v3/__https:/www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11766.html__;!!F7jv3iA!lUiP4Sxl2_vGAEHW6lBaGua0x3QBQaOZmI0jmXMtsq8v-V2adkYRmM2PkYwPh-c3rQ$)
      9. ISED believes there are significant benefits of harmonizing the use of the 5895-5925 MHz band for ITS with the US
      10. For extending RLAN operation to the 5850 - 5895 MHz, ISED proposes that "all indoor and outdoor license-exempt RLAN devices have immediate access to the 5850-5895 MHz range once appropriate technical standards are in place
   4. Anything else to share today for other regions?
6. Chair presents slides 22, **ITU-R items to share**
   1. The 802.11 ITU AH will be meeting during the plenary, Thu, March 10, 1pm – 3pm(pt). Call-in info is in IEEE 802 calendar. The ad hoc will be working on WP5A contributions, see next.
   2. **24feb:** 
      1. [<WP5A>](https://www.itu.int/go/ITU-R/wp5a),  **next meeting is 23may to 03jun22 in Geneva**. **Contributions due: Monday, 16 May 2022, 16:00UTC**
      2. .18 will see the M.1450 / M.1801 contributions from .11 later in March and goal to have though EC in April, likely their 05apr22 (first Tuesday) call.
      3. Current .11 drafts:
      4. <https://mentor.ieee.org/802.11/dcn/22/11-22-0379-01-0itu-proposed-modifications-to-itu-r-m-1801-2.docx>
      5. <https://mentor.ieee.org/802.11/dcn/22/11-22-0378-00-0itu-proposed-modifications-to-itu-r-m-1450-5.docx>
      6. USA FCC WAC last week, did approve the 6 GHz document, Doc 43, next to NTIA, then to CITEL.
      7. ITU-T – Monday has a global standards symposium maybe an interest to some; <https://gss.itu.int/>
   3. Anything else to share today?

* 1. **standing by for this spring (2022):** Additional WP 1A light communications submission from IEEE 802.
  2. **ongoing: WRC-23 agenda items, the list is on the ITU-R website at:** 
     + 1. <https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-23-studies.aspx> (updated 26Aug20)
       2. <https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000D0041PDFE.pdf>
     1. <https://mentor.ieee.org/802.18/dcn/20/18-20-0107-01-0000-res-811-wrc-19-wrc-23-agenda-items.docx>
     2. **IEEE 802 viewpoints on WRC-23 agenda items.** 
        1. Doc for viewpoints updated (actions items in notes on this slide in agenda): <https://mentor.ieee.org/802.18/dcn/21/18-21-0039-01-0000-ieee-802-viewpoints-on-wrc-23-agenda-items.pptx>
        2. Soon, will review actions noted at the July Plenary.
     3. Reference:
        1. btw- the initial AIs to consider IEEE 802 viewpoints:
           1. 1.1 -800-4 990 MHz and Resolution 223. Connection w/ITS going there?
           2. 1.2 -300-3 400MHz, 3 600-3 800MHz, 6 425-7 025MHz, 7 025-7 125MHz and 10.0-10.5GHz for International Mobile Telecommunications (IMT) and resolution 245.
           3. 1.5 -470-960 MHz in Region 1-consider possible regulatory actions, Resolution **235.**
           4. 10 **-**recommend to the Council items for inclusion in the agenda for the next WRC
  3. For miscellaneous links for ITU-R, SGs, WPs and calendars, see back up slides in agenda.

1. Chair presents slide 23, **General Discussion Items**
2. Chair presents slide 24, **General Discussion Items – ongoing fyi - MSGs 6 GHz**
   1. **1. The WInnforum “6 GHz Committee”,** all groups meet every 2 weeks except *Incumbent Information, interference and Test & Certification* - weekly (168 people); some docs: <https://6ghz.wirelessinnovation.org/work-group-products>
      * 1. <https://www.wirelessinnovation.org/6ghz-multistakeholder-committee>
        2. For access to documents from the committee, can request to be an observer from the MSG below.
      1. Org: 2 focus areas:
         1. 1) AFC Functional Specification -WG – includes: Interference-TG, Incumbent Info-TG, security and Protocols 3GPP-TG
         2. 2) AFC Test and Certification-WG
      2. **24feb:** Moving ahead and in the next 4 weeks will have canvased the 3rd party test labs to then start up some testing.
      3. This is in parallel with what the WFA is doing on this.
   2. **2. From the FCC R&O, an informal MSG (“Group”) has also been formed.** (260+ people)
      1. <https://groups.wirelessinnovation.org/wg/6MSG/dashboard>.
         1. Work stream 1 - interference protection and resolution (CableLabs, EPRI, Lake Cty, APCO) Meets biweekly, from 28Jan21-10:00 et,
         2. Work stream 2 - correct incumbent data (ULS) (Comsearch, APCO)
         3. Work stream 3 - AFC and how it provides protection, etc. (Charter, Google, UTC)
         4. Overall Co-chairs: NPSTC, UTC, WFA, WISPA.
      2. **03mar:**  Monthly meeting, passed a motion, agreed on how to put in report from WS1 dissenting responses.
      3. **24feb:** WS1 – interference call today. 2 viewpoints on this, APCO&others / NCTA & others, first time to have an open discussion and getting on the table. Here is one, behind UN/PW: <https://groups.wirelessinnovation.org/wg/6GHz-MSG-WS1/document/16974>

* 1. **General:** 
     1. 03feb: FCC getting inputs and setting up interviews on companies for the AFC accreditation.
     2. 16dec: **A** public notice is expected in January about work needed on improving the ULS data.

1. Chair presents slide 25, **General Discussion Items – ongoing fyi - Table of IEEE 802 Stds Frequency Ranges**
   1. **Problem statement**
      1. It is difficult for 802 wireless standards developers to quickly and accurately identify all the frequency bands by the family of 802 wireless standards in a regularly maintained database.
      2. The primary application is to simplify identification of potential frequency bands for coexistence assessment.
   2. **Initial Audiences:** 
      1. 1) 802 wireless standards developers
      2. 2) 802.19 wireless coexistence working group
   3. **Ad hoc calls:** 
      1. The spreadsheet is going, always look for latest:
      2. <https://mentor.ieee.org/802.18/dcn/22/18-22-0009-00-0000-ieee-802-wireless-standards-table-of-frequency-ranges.xlsx>
   4. At the WCSC monthly call Wednesday, 02 Mar 2022, the comment collection process was reviewed, and custom comment collection form introduced: <https://mentor.ieee.org/802.18/dcn/22/18-22-0030>
   5. Comment collection will run until 30 Apr 2022, at which time the ad hoc team will act as the CRG and review and implement accordingly the comments.
   6. **From ad hoc call on 22feb22**
      1. Worked on comment collection epoll text and process. Will discuss with 802 Executive Secretary.
      2. The Co-leads have epoll text updated and a comment collection spreadsheet draft to present at WCSC call 02mar22.
      3. Looking at proposing adding the link to the IEEE 802 Wireless Stds Table of Frequency Ranges to the IEEE 802 web page under the Orientation link.
   7. **The next meeting will be 22mar22. (call-in in agenda backup slides) (May be cancelled if epoll is running)**
2. Chair presents slide 26, Actions / AOB / Recess
   1. **Actions required:** 
      * Chair turn in results of elections for EC confirmation,
   2. **AOB before recess to next Thursday?**
      1. remember to sign into IMAT.
   3. Remember, must be registered and to log attendance in **IMAT** (and participation credit available)
   4. **Recessed at 15:57 until next Thursday 17mar22, 15:00et/19:00utc**
3. Chair presents slide 27, **2nd – call - Thursday (17mar22) Agenda**
4. Chair calls the meeting to order at 15:02 et
5. Chair presents 802.18-22/0027r02, the call to order and administrative items for 2nd call of session.
   1. **Reminder we are still under all IEEE policies as shown last Thursday**
      1. **Attendance is on IMAT (w/VC and webex checks)**
      2. **Remember to mute when not speaking, thanks.**
      3. **Please request Q in the chat window.**
      4. Someone to take a few notes: \_Peter E.\_
      5. Attendance and request queue in chat window, Stuart K.
   2. **Administration items**
   3. **Routine items or from last week or new**
   4. **Administration items**
   5. **Discussion items** 
      1. EU Items
      2. Other Regions Items
      3. ITU-R Items w/liaisons
      4. General Discussion Items
   6. **Actions required**
      1. Anything new today
      2. ongoing: WRC-23 AI Viewpoints & Freq. table fill in
   7. **AOB**
   8. **Adjourn**
   9. **Any objections to accepting the agenda?**
      1. None heard
      2. **Results:** Approved by unanimous consent
6. **Chair presents slide 28, Administrative–moving forward**
   1. For the 8-13 **May 2022 Wireless Interim** in Warsaw, Poland, the WCSC voted (02feb22) to head in the direction of mixed-mode (9-1-0) and will continue as such from meeting 02mar22.
      1. The fees were also voted on at $950/$1200/$1450 with cut off dates of 08Apr/29Apr. Same fee whether in person or remote.
      2. Yes, what is going on in eastern Europe was discussed and the team is preparing what they can if the Interim has to go to all virtual later.
      3. **Note; there is a WCSC call next Wednesday about the Warsaw session, watch for updates next week.**

* 1. For the **July 2022 Plenary in Montreal, Canada,** poll results:
  2. **#1 would you attend if in-person:** 
     1. .18 .1 .3 .11 .15 .19
     2. Yes 18 44 124 98 24 20 328-54%
     3. No 5 31 128 90 15 10 279-46%
  3. **#2 if mixed-mode how will you attend:**
     1. Attend In-person
        1. 15 34 91 74 20 16 250-40%
     2. Attend Virtually (remotely)
        1. 8 36 153 118 25 14 354 -57%
     3. Will not attend plenary
        1. 0 2 8 7 1 0 18-3%
  4. **The 2022 May 802 Wireless Interim Session is scheduled to be held in Warsaw, Poland as a mixed mode session, will you attend?** .18 .11 .15
     1. Attend In-person; \_7\_ 45 14
     2. Attend Virtually (remotely); \_13\_ 168 28
     3. Will not attend plenary \_5\_ (3dnv) 14 4

1. **Chair presents slides 29-30, EU items to share**
   1. General EU info: [<ojeu>](https://eur-lex.europa.eu/oj/direct-access.html) [<HStds>](https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/) <https://www.etsi.org/deliver/etsi_en/>
   2. Remember–BRAN documents can be found in the 802.11 private area documents (daily refresh)
      1. for reference, ad hoc meetings can make decisions, rapporteur meetings can not.
   3. **ETSI –** [**<BRAN>**](https://portal.etsi.org/tb.aspx?tbid=287&SubTB=287) **next meeting #114, 03-10jun22 (Sophia-Antipolis, FR)**
      1. **In between ad hocs at this point.** 
         1. EN 303 722 and EN 301 598 will be published soon as they have come out of ENAP.
         2. EC (RED) Assessments maybe coming back to normal, watch for updates.
         3. At ad hoc coming for EN 303 687 could be going to ENAP soon after.
      2. **24feb:** 1 ad hoc so far on TS 103 754 mesh AP performance testing was approved. Next is ETSI helpdesk will review then will be published.
         1. EN 303 687 (6GHz) ETSI helpdesk is reviewing the draft, then after that to the EC for assessment. as reported, it may not be assessed, then if not it will move on to ENAP for 90 days.
         2. **More ad hocs will be coming, 21mar–112e on TR 103 721 (mitigation at 5.8 GHz;**
         3. **21mar–113e on EN 303 687 (6 GHz); 22mar–113d on EN 303 722 (60 GHz);**
         4. **31mar–113b on TS 103 754 (mesh AP performance testing)**
   4. **ETSI – ERM** [**<TG-UWB>**](https://portal.etsi.org/tb.aspx?tbid=729&SubTB=729) **next meeting #61, 03-05may22 (t.b.d, FR)**
   5. **CEPT –** [**<ECC>**](https://cept.org/ecc/groups/ecc/client/introduction/) **(and general items) next call, #59 28jun-01jul22, where tbd**
      1. [**https://www.cept.org/cept/news/suspension-of-the-russian-federation-and-belarus-from-cept-membership/**](https://www.cept.org/cept/news/suspension-of-the-russian-federation-and-belarus-from-cept-membership/)
   6. **CEPT – ECC** [**<SE45>**](https://cept.org/ecc/groups/ecc/wg-se/se-45/client/introduction/) **(5925-7125 MHz) next meeting #16, 29jun-01jul22, hybrid meeting** 
      1. **From 03-04mar #15:** SE45\_03 6GHz OOB emissions limits below 5935MHz: To further study OOB emissions from Very Low Power (VLP) WAS/RLAN devices operating in the band 5945–6425 MHz to protect CBTC systems that operate in the band 5915-5935 MHz.
         1. SE45\_04 WAS/RLAN technical studies on 6425-7125 MHz,
      2. **03mar:** Agenda is on SE45\_03 CBTC, communications-based train control, train to track side.
         1. There is SE45\_04 is on the 6425-7125 MHz, Std. Power., looks like another update to move back SE45, more info will be coming in the next couple of days.
   7. **CEPT – ECC** [**<WGFM>**](https://cept.org/ecc/groups/ecc/wg-fm/client/introduction/)  **next meeting #102 06-10jun22, where tbd**
   8. **CEPT** [**–**](https://cept.org/ecc/groups/ecc/wg-fm/srdmg/client/meeting-calendar/) **ECC** [**<SRDMG>**](https://cept.org/ecc/groups/ecc/wg-fm/srdmg/client/meeting-calendar/)  **next meeting 28Mar web meeting then #85 20-21apr22 ECO office** 
      1. **For 28mar22 -** Higher power Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) including the use of equipment with 1 to 4 W e.i.r.p. in the 5945-6425 MHz frequency band using a dynamic spectrum usage coordination
   9. **CEPT – ECC** [<CG-UWB>](https://cept.org/ecc/groups/ecc/wg-fm/srdmg/cg-uwb/client/introduction/) **meeting #5-#6 was 10-11Mar22**
   10. nice site: CEPT 6 GHz status across the countries: <https://docdb.cept.org/implementation/16737>
       1. 16dec: showing 3 -4 countries note, updating this site is very slow, beware.
2. Chair presents slides 31-33, **Other regions (outside EU-Stds and USA), items to share**
   1. **APAC update:** 
      1. <https://mentor.ieee.org/802.18/dcn/22/18-22-0010-01-0000-apac-update-march-2022.pptx>
      2. The legislation itself for ACMA consultation and see below for more: <https://www.legislation.gov.au/Details/F2022L00249/Html/Text>
   2. **Canada-ISED has two consultations started.** 
      1. Comments due on both, 29April 22 (so out of.18 by 14April22).
      2. One on > 95 GHz
         1. <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11767.html>
         2. Specific change to the spectrum utilization for spectrum above 95 GHz are discussed, specifically, "to allow the use of licence-exempt devices in the 116-122.25 GHz, 122.25-123 GHz, 174.8-182 GHz, 185-190 GHz and 244-246 GHz bands on a no-protection, no-interference basis
         3. Specific technical conditions, which are similar to those of 57-71 GHz, are proposed
         4. License exempt and backhaul are talked to.
      3. One on 5.9 GHz;
         1. [https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11766.html](https://urldefense.com/v3/__https:/www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11766.html__;!!F7jv3iA!lUiP4Sxl2_vGAEHW6lBaGua0x3QBQaOZmI0jmXMtsq8v-V2adkYRmM2PkYwPh-c3rQ$)
         2. ISED believes there are significant benefits of harmonizing the use of the 5895-5925 MHz band for ITS with the US
         3. For extending RLAN operation to the 5850 - 5895 MHz, ISED proposes that "all indoor and outdoor licence-exempt RLAN devices have immediate access to the 5850-5895 MHz range once appropriate technical standards are in place
   3. **UK-Ofcom Consultation on upper 6GHz**
      1. <https://www.ofcom.org.uk/consultations-and-statements/category-2/spectrum-sharing-upper-6-ghz-b>
      2. <https://mentor.ieee.org/802.18/dcn/22/18-22-0029-00-0000-ofcom-consultation-on-spectrum-sharing-6ghz.zip>
      3. The consultation proposes to add upper 6 GHz, specifically 6425 MHz to 7070 MHz, to shared licences for local, low-power indoor use. (not a discussion on license-exempt)
      4. The comment submission deadline is April 11, 2022 (so out of .18 by 24March22)
      5. Have had an input on a possible response on how to support home network environment with shared access.
      6. <https://mentor.ieee.org/802.18/dcn/22/18-22-0031-01-0000-ofcom-saf-consultation-draft-response.odt>
      7. Reviewed today:
         1. A few editorial format updates were made and uploaded as r01. Limited feedback so will proceed for approval next week to then get to the EC (and Ofcom).
   4. **Australia ACMA on March 10 published the *outcome* of its consultation** "Radio local area networks (RLANs) in the 6 GHz band - consultation 37/2021"**.**
      1. **In summary,**
      2. ACMA allows RLAN devices in the lower band.
      3. 1) The power limits of low power indoor devices and very low power devices are broadly aligned with those adopted in Europe and the UK.
      4. 2) ‘indoor’ does not include inside vehicles.
      5. 3) Contained a requirement that devices must implement contention-based protocols for multiple access, e.g., CSMA or MACA.
      6. ACMA did not make decisions on the following topics .
      7. a) Possible updates to the use of the 5 GHz band related to higher power limits and outdoor use,
      8. b) Higher power devices in the 6 GHz band,
      9. c) The future use of the upper 6 GHz band (6425~7125 MHz),
      10. d) The potential of AFC.
      11. For details, please download the outcome paper at:
      12. <https://www.acma.gov.au/sites/default/files/2022-03/Outcomes%20Paper_Proposed%20updates%20to%20the%20LIPD%20Class%20Licence%20for%206%20GHz%20RLANs.pdf>
      13. The legalization is also updated and you can find the updated LIPD class license information at:
      14. [https://www.legislation.gov.au/Details/F2022L00249](https://urldefense.com/v3/__https:/www.legislation.gov.au/Details/F2022L00249__;!!F7jv3iA!l_W2K4GkDZ5GzgQDxAOUg-n_YCHfeOLK0-4Ezd-kM0l5Lhf-KWyOgxvMo1sQsdjpWw$)
   5. Anything else to share today for other regions?
3. Chair presents slides 34, **ITU-R items to share**
   1. [**<WP5A>**](https://www.itu.int/go/ITU-R/wp5a)**, next meeting 23may-03jun22 in Geneva. Contributions due: Monday, 16 May 2022, 16:00UTC**
      1. The .11 ITU ad hoc 2 contributions for WP5A should be ready for .18 to work toward approval and then to the EC.
         1. <https://mentor.ieee.org/802.11/dcn/22/11-22-0378-02-0itu-proposed-modifications-to-itu-r-m-1450-5.docx>
         2. <https://mentor.ieee.org/802.11/dcn/22/11-22-0379-02-0itu-proposed-modifications-to-itu-r-m-1801-2.docx>
      2. And they are ready and are now in .18 Mentor:
         1. <https://mentor.ieee.org/802.18/dcn/22/18-22-0032-00-0000-proposed-modifications-to-itu-r-m-1450-5.docx>
         2. <https://mentor.ieee.org/802.18/dcn/22/18-22-0033-00-0000-proposed-modifications-to-itu-r-m-1801-2.docx>
      3. Next is for .18 review, update as needed, approve and send to the LMSC(EC) for approval.
      4. **Target can be for EC call on 05apr22, or back up is 10-day ballot early-mid April**
      5. For EC call, consent agenda request by Monday 29March, or EC would need to vote on 05apr22
   2. **WP5D, the required registration for the WP5D WG SPECTRUM ASPECTS & WRC-23 PREPARATIONS “interim” meeting (19.-22. April 2022) has been opened** [**here**](https://www.itu.int/net4/CRM/xreg/web/registration.aspx?Event=C-00011128)**.** 
      1. Please be informed, that the required registration for the WP5D **WG SPECTRUM ASPECTS & WRC-23 PREPARATIONS “interim” meeting** (19.-22. April 2022) has been opened [here](https://www.itu.int/net4/CRM/xreg/web/registration.aspx?Event=C-00011128). On the [WP5D Website](https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/default.aspx), you can find further information regarding [ToR, contribution deadline, logistics](https://www.itu.int/dms_pub/itu-r/oth/0a/06/R0A060000AB0001PDFE.pdf).
      2. Please also note: As this is a physical meeting with remote participation, delegates are kindly requested to indicate their planned method for participation. This can be done when registering – please tick “remote” if you plan to participate remotely only.
   3. Anything else to share today?
   4. **standing by for this spring (2022):** Additional WP 1A light communications submission from IEEE 802.
   5. **ongoing: WRC-23 agenda items, the list is on the ITU-R website at:** 
      1. <https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-23-studies.aspx> (updated 26Aug20)
         1. <https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000D0041PDFE.pdf>
         2. <https://mentor.ieee.org/802.18/dcn/20/18-20-0107-01-0000-res-811-wrc-19-wrc-23-agenda-items.docx>
   6. **IEEE 802 viewpoints on WRC-23 agenda items.** 
      1. Viewpoints(actions items in notes on this slide in agenda): <https://mentor.ieee.org/802.18/dcn/21/18-21-0039-01-0000-ieee-802-viewpoints-on-wrc-23-agenda-items.pptx>
      2. Reference:
         1. btw- the initial AIs to consider IEEE 802 viewpoints:
            1. 1.1 -800-4 990 MHz and Resolution 223. Connection w/ITS going there?
            2. 1.2 -300-3 400MHz, 3 600-3 800MHz, 6 425-7 025MHz, 7 025-7 125MHz and 10.0-10.5GHz for International Mobile Telecommunications (IMT) and resolution 245.
            3. 1.5 -470-960 MHz in Region 1-consider possible regulatory actions, Resolution **235.**
            4. 10 **-**recommend to the Council items for inclusion in the agenda for the next WRC
   7. For miscellaneous links for ITU-R, SGs, WPs and calendars, see back up slides in agenda.
4. Chair presents slide 35, **General Discussion Items - –**
   1. **USA FCC - The Office of Engineering and Technology (OET) released a consultation on March 10 that seeks comment following the Court remand of 6 GHz band order.**
      1. In particular, it emphasizes the following:
      2. *In this Public Notice, we seek comment on NAB’s arguments in the Commission’s proceeding regarding broadcasters’ experience in the 2.4 GHz band, how that experience relates to the kinds of contention-based protocol operations prescribed for indoor use in the 6 GHz rules, and whether the 2.4 GHz experience warrants reservation of a portion of the 6 GHz band for mobile indoor operations or any other modification to the Commission’s 6 GHz rules. We emphasize that, in light of the limited scope of the court’s remand, we do not seek comment on any other aspects of the 6 GHz Report and Order.*
      3. For details, please visit:
      4. [https://www.fcc.gov/document/oet-seeks-comment-following-court-remand-6-ghz-band-order](https://urldefense.com/v3/__https:/www.fcc.gov/document/oet-seeks-comment-following-court-remand-6-ghz-band-order__;!!F7jv3iA!nl2VXsC6w3mFF42j5R7AughnO4I8N6BfgakxUS53hRH5sYvk2Kn4lXkgsNtuGzb_YQ$)
   2. Mentor: <https://mentor.ieee.org/802.18/dcn/22/18-22-0034-00-0000-oet-seeks-comment-following-court-remand-6-ghz-band-order.docx>
5. Chair presents slide 36, **General Discussion Items – ongoing fyi - MSGs 6 GHz**
   1. **1. The WInnforum “6 GHz Committee”,** all groups meet every 2 weeks except *Incumbent Information, interference and Test & Certification* - weekly (168 people); some docs: <https://6ghz.wirelessinnovation.org/work-group-products>
      * 1. <https://www.wirelessinnovation.org/6ghz-multistakeholder-committee>
        2. For access to documents from the committee, can request to be an observer from the MSG below.
      1. Org: 2 focus areas:
         1. 1) AFC Functional Specification -WG – includes: Interference-TG, Incumbent Info-TG, security and Protocols 3GPP-TG
         2. 2) AFC Test and Certification-WG
      2. This week in test and certification meeting, a federated filling to the FCC was made to use exiting test and methods to certify equipment with AFC, which is a different direction from earlier discussions.
         1. Many test houses are approved to certify U-NII equipment and only ~20 to do CBRS. FCC wants to lean like they have done before, but AFC is not like other radios and processes and more complicated.. Discussions continue.
   2. **2. From the FCC R&O, an informal MSG (“Group”) has also been formed.** (260+ people)
      1. <https://groups.wirelessinnovation.org/wg/6MSG/dashboard>.
         1. Work stream 1 - interference protection and resolution (CableLabs, EPRI, Lake Cty, APCO) Meets biweekly, from 28Jan21-10:00 et,
         2. Work stream 2 - correct incumbent data (ULS) (Comsearch, APCO)
         3. Work stream 3 - AFC and how it provides protection, etc. (Charter, Google, UTC)
         4. Overall Co-chairs: NPSTC, UTC, WFA, WISPA.
      2. Still working on final report, probably through the summer (with both views, since no consensus)
   3. **General:** 
      1. 03feb: FCC getting inputs and setting up interviews on companies for the AFC accreditation.
      2. 16dec: A public notice is expected in January about work needed on improving the ULS data.
6. Chair presents slide 37, **General Discussion Items – ongoing fyi - Table of IEEE 802 Stds Frequency Rnages**
   1. **Problem statement**
      1. It is difficult for 802 wireless standards developers to quickly and accurately identify all the frequency bands by the family of 802 wireless standards in a regularly maintained database.
      2. The primary application is to simplify identification of potential frequency bands for coexistence assessment.
   2. **Initial Audiences:** 
      1. 1) 802 wireless standards developers
      2. 2) 802.19 wireless coexistence working group
   3. **Ad hoc calls:** 
      1. The spreadsheet is going, always look for latest:
      2. <https://mentor.ieee.org/802.18/dcn/22/18-22-0009-00-0000-ieee-802-wireless-standards-table-of-frequency-ranges.xlsx>
   4. **At the WCSC monthly call Wednesday, 02 Mar 2022, the comment collection process was reviewed, and custom comment collection form introduced:** [**https://mentor.ieee.org/802.18/dcn/22/18-22-0030**](https://mentor.ieee.org/802.18/dcn/22/18-22-0030)
   5. **Comment collection will run until 30 Apr 2022,** at which time the ad hoc team will act as the CRG and review and implement accordingly the comments.
   6. **From ad hoc call on 22feb22**
      1. Worked on comment collection epoll text and process. Will discuss with 802 Executive Secretary.
      2. The Co-leads have epoll text updated and a comment collection spreadsheet draft to present at WCSC call 02mar22.
      3. Looking at proposing adding the link to the IEEE 802 Wireless Stds Table of Frequency Ranges to the IEEE 802 web page under the Orientation link.
   7. The **next meeting will be 22mar22.** (call-in in agenda backup slides) (May be cancelled if comment collection is running (not going to do an epoll))
7. Chair presents slide 38, **Actions Required**
   * **Chair to upload Rev 1 of the UK-Ofcom proposed response. done.**
   * **Next week need to review and ballot for approval the UK consultation response.**
   * **FCC PN on 6 GHz uploaded. done.**
   * **Next week should review the M.1450 and M.1801 submissions.**
   1. **ongoing:**
   * For IEEE 802 viewpoints on WRC-23 AIs, reach out to those identified, looking for input on the viewpoints.
   1. **Proactive Spectrum Sharing – Contact Rich Kennedy if you can help or have inputs. or want to join the task force.**
8. Chair presents slide 39 Any Other Business
   1. remember to sign into IMAT.
   2. Again congrats to Edward who will be picking up chair duties tomorrow night (18mar22).
      1. All – please be patient as the transition progresses that could take weeks to possible a month or two. Many things to change over, meeting call-ins, Listserver, Mentor, MyProject, contribution templates and IEEE specifics, and i am sure more.
9. Chair presents slide 40, Adjourn.
   1. **Next “weekly” teleconference (sched’d to 19may22): 24mar22 –*15:00–<15:55* et** 
      1. Call in info: <https://mentor.ieee.org/802.18/dcn/16/18-16-0038-20-0000-teleconference-call-in-info.pptx>
      2. Also, see back up slide in this agenda.
      3. All late changes/cancellations will be sent out to the 802.18 list server.
   2. Overall IEEE 802 schedule: <http://ieee802.org/802tele_calendar.html>
      1. or only 802.18: [IEEE 802.18 TAG Calendar](https://calendar.google.com/calendar/embed?src=c2gedttabtbj4bps23j4847004%40group.calendar.google.com&ctz=America%2FNew_York)
   3. Adjourn:
      1. Any objection to Adjourn.
      2. None heard, Adjourn at 15:55et
   4. **The next IEEE 802.18 Wireless Interim will be in 8-13 May 2022, Warsaw, Poland mixed-mode (so far).**
   5. **The next IEEE 802.18 Plenary will be in July 2022, looking like in Montreal, Canada**
   6. **Thank You**
10. Attendance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Voting Attendees:** | |  |  | **10-Mar** | **17-Mar** |
| 1 | **Au** | Edward (Kwok Shum) | Huawei Technologies Co., Ltd | **x** | **x** |
| 2 | **Baykas** | Tuncer | Kadir Has University | **x** |  |
| 3 | **Berens** | Friedbert | FBConsulting Sarl | **x** | **x** |
| 4 | **Boldy** | David | Broadcom Corporation | **x** | **x** |
| 5 | **da Silva** | Claudio | Meta Platforms, Inc. | **x** | **x** |
| 6 | **de Vegt** | Rolf | Qualcomm Incorporated | **x** | **x** |
| 7 | **Ecclesine** | Peter | Cisco Systems, Inc. | **x** | **x** |
| 8 | **Godfrey** | Tim | Electric Power Research Institute, Inc. (EPRI) | **x** |  |
| 9 | **Hiertz** | Guido | Ericsson GmbH | **x** | **x** |
| 10 | **Holcomb** | Jay | Itron Inc. | **x** | **x** |
| 11 | **Ikegami** | Tetsushi | Meiji University | **x** | **x** |
| 12 | **Jeffries** | Timothy | FutureWei Technologies, Inc. | **x** | **x** |
| 13 | **Jones** | Vincent Knowles IV | Qualcomm Incorporated | **x** |  |
| 14 | **Kain** | Carl | USDOT, Noblis, Inc. | **x** |  |
| 15 | **Kasher** | Assaf | Qualcomm Incorporated | **x** | **x** |
| 16 | **Kennedy** | Richard | Self | **x** |  |
| 17 | **Kenney** | John | TOYOTA InfoTechnology Center U.S.A. | **x** | **x** |
| 18 | **Kerry** | Stuart | OK‐Brit, Self | **x** | **x** |
| 19 | **Kürner** | Thomas | TU Braunschweig | **x** | **x** |
| 20 | **Lansford** | James | Qualcomm Incorporated | **x** | **x** |
| 21 | **Levy** | Joseph | InterDigital, Inc. |  | **x** |
| 22 | **Lynch** | Michael | MJ Lynch & Associates, LLC. | **x** | **x** |
| 23 | **Nikolich** | Paul | Self, HPE, Huawei, Wyebot, UNH BCoE, YAS BBV, Origin Wireless | **x** | **x** |
| 24 | **Petranovich** | James | ViaSat, Inc. | **x** | **x** |
| 25 | **Petrick** | Al | Skyworks Solutions Inc. | **x** | **x** |
| 26 | **Pirhonen** | Riku | NXP Semiconductors | **x** | **x** |
| 27 | **Robert** | Joerg | TU-Ilmenau/Fraunhofer IIS | **x** | **x** |
| 28 | **Rolfe** | Benjamin | Blind Creek Associates |  | **x** |
| 29 | **Sand** | Stephan | German Aerospace Center (DLR) | **x** | **x** |
| 30 | **Sato** | Naotaka | Sony Group Corporation | **x** | **x** |
| 31 | **Scott** | Andy | NCTA – The Internet & Television Association | **x** |  |
| 32 | **Sherlock** | Ian | Texas Instruments | **x** | **x** |
| 33 | **Verso** | Billy | Qorvo | **x** | **x** |
| 34 | **Wang** | Lei | FutureWei Technologies, Inc. | **x** |  |
| 35 | **Ward** | Lisa | Rohde & Schwarz | **x** | **x** |
| 36 | **Yaghoobi** | Hassan | Intel Corporation |  | **x** |
| 37 | **Yucek** | Tevfik | Qualcomm Incorporated | **x** | **x** |
|  |  |  |  |  |  |
| **Non-Voting Attendees:** | | |  |  |  |
| 1 | **Andersdotter** | Amelia | Sky UK Group | **x** | **x** |
| 2 | **Eitan** | Alecsander | Qualcomm Incorporated | **x** | **x** |
| 3 | **Fang** | Yonggang | MediaTek | **x** | **x** |
| 4 | **Haasz** | Jodi | IEEE SA | **x** |  |
| 5 | **Richardson** | Judah | Self |  | **x** |