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| **Radiocommunication Study Groups** |  |
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|  | **Document 5C/59-E** |
| **17 August 2020** |
| **English only** |
| Chairman, Working Party 5C |
| REPORT ON THE twenty third MEETING OF WORKING PARTY 5C |
| (Geneva, e-Meeting, 20-29 July 2020) |

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# 1 Introduction

This document presents the main results of the twenty-third meeting of ITU-R Working Party (WP) 5C, which, due to the emergency situation due to the Covid-19 virus, was held online from 20 to 29 July 2020. The meeting was kindly assisted by Mr. Uwe Loewenstein, as new Counsellor for WP 5C.

In the Appendices to this document the active ITU-R Questions are reported, together with the structure of the Chairman’s Report.

Abbreviations that may be found in this Report

AI Agenda item

BR Radiocommunication Bureau

DG Draft Group

FS Fixed System

HAPS High-Altitude Platform Station

PDN Preliminary Draft New

LS Liaison Statement

NGSO Non Geostationary Satellite Orbit

RLS Radio Location Service

SDO Standards Developing Organizations

SG Study Group

WD Working document

WG Working Group

WP Working Party

WPT Wireless Power Transmission

WRC World Radio Conference

Working Party 5C (WP 5C): Fixed wireless systems; HF and other systems below 30 MHz in the fixed and land mobile services

The work has been carried out by means of four Working Groups:

|  |  |
| --- | --- |
| WG 5C-1: | This Working Group (WG) is responsible for addressing any issues concern spectrum at or below 3 GHz. |
| WG 5C-2: | This WG deals with any issues addressing spectrum frequencies higher than 3 GHz up to 86 GHz. |
| WG 5C-3: | This WG deals with any issues addressing spectrum frequencies higher than 86 GHz, as well as interdisciplinary topics, within and outside ITU-R, having not been assigned to any particular WG. |
| WG 5C-4: | This WG addresses the Review and proposed revisions of Recommendations and Reports not specifically assigned to other WGs, the activities related to WRC-23 A.I. 9.1.c, the maintenance of FS deliverables and revision of Questions, the Vocabulary related topics. |

# 2 Executive Summary

The opening plenary meeting was held on 20th July 2020, closing plenary was held on 29th July 2020 to approve the deliverables agreed by WGs 1, 2, 3, 4.

Two joint sessions were held with WP 5A to discuss joint activities between two groups, in particular the documents submitted in relation with WRC-23 AI 1.9 topic c and Resolution ITU‑R 59-2 (ENG/PMSE).

No activities were finalized at this meeting.

Activities were progressed for:

– Revision of Recommendation ITU-R F.383-9 – *Radio-frequency channel arrangements for high-capacity fixed wireless systems operating in the lower 6 GHz (5 925 to 6 425 MHz) band.*

– Report ITU-R F.[HF ENVIRONMENT] – *Technical and operational characteristics for fixed wireless systems operating within the 40-50 MHz frequency range*

– Report ITU-R F.[CSA] – *Technical and operational characteristics of radio frequency central alarm systems operating in the fixed service in the frequency range 450-470 MHz*

– Handbook ITU-R [HF ADAPTIVE HANDBOOK] – *A tutorial on frequency adaptive communication systems in the HF bands.*

– Revision of Recommendation ITU-R F.637-4 *– Radio-frequency channel arrangements for fixed wireless systems operating in the 21.2-23.6 GHz band.*

New activities were proposed and initial discussions were held for:

– Recommendation ITU-R F.595-10 – *Radio-frequency channel arrangements for fixed wireless systems operating in the 17.7-19.7 GHz frequency band.*

– Recommendation ITU-R F.749-3 – *Radio-frequency arrangements for systems of the fixed service operating in sub-bands in the 36-40.5 GHz band.*

– Revision of Rec. ITU-R F.758-7 – *System parameters and considerations in the development of criteria for sharing or compatibility between digital fixed wireless systems in the fixed service and systems in other services and other sources of interference.*

– Revision of Recommendation ITU-R F.1777-2 – *System characteristic of television outside broadcast, electronic news gathering and electronic field production in the fixed service for use in sharing studies.*

– Revision of Recommendation ITU-R F.2416-0 – *Technical and operational characteristics and applications of the point-to-point fixed service applications operating in the frequency band 275-450 GHz.*

Following activities will be carried forward to next meeting:

– Revision of Recommendation ITU-R F.1520-3 *– Radio-frequency arrangements for systems in the fixed service operating in the band 31.8-33.4 GHz*

– Revision of Recommendation ITU-R F.2005 *– Radio-frequency channel and block arrangements for fixed wireless systems operating in the 42 GHz (40.5 to 43.5 GHz) band*

Liaisons activity was undertaken in relation with:

– HF unwanted emissions, frequencies above 86 GHz, EES protection criteria for frequencies above 92 GHz.

– Reply liaisons were sent to responsible and contributing WPs n relation with WRC-23 AIs 1.2, 1.12, 1.13, 1.14, 1. 15, 1.16, 1.17, 1.18, 1.19, addressing technical characteristics and protection criteria to be used for studies involving the FS.

All documents under progress are available as Annexes to the Chairman’s Report, whose structure, including the development of Annexes in current the study period, can be found in Appendix 2 of this document.

In total, 74 input documents were considered.

# 3 Activities addressed by WP 5C Plenary

Documents [5C/ADM/1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-ADM-0001) and [5C/ADM/2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-ADM-0002) (meeting agenda and documents allocation) were available for opening plenary, [5C/ADM/6](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-ADM-0006) for the final plenary sessions.

## 3.1 Chairman’s Report approval

Document [5C/648](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0648) (Chairman’s Report of the twenty-second WP 5C meeting in Geneva, April/May 2019), including 12 annexes, was approved at the opening plenary.

## 3.2 Input documents presentation and discussions

Document [5C/1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0001) (BR) contains the list of documents addressed to WP 5C, received by the Bureau between the last WP 5C meeting (May-June 2019, No. 22) of the end of previous Study Period, to be carried on in the present Study period.

Each document has been allocated to proper Working Group.

ITU-R SG 5 May 2019 meeting and WP 5C documents updating

Document [5C/31](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0031) (Chairman) provides a short summary of the agreement of ITU-R SG 5 related to the documents submitted by ITU-R WP 5C during 2019, together with an update of the status of same deliverables after the approval process.

Document [5C/32](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0032) (Chairman) provides tables containing the Questions, Recommendations, Reports, Handbooks under responsibility of WP 5C, together with the list of WRC-23 agenda items where WP 5C is involved; reference to related Resolutions is also included.

Highlights on some ITU-R high level meetings

Document [5C/31](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0031) (Chairman) provides a few highlights of the results of meetings of RA, WRC, CPM, RAG, CVC, which were held after the last WP 5C meeting (May-June 2019, No. 22), together with the reference to main documents where more information is available. Among other topics, the newly agreed corresponding group on Gender, the discussions for training of Chairs and Vice-chairs, the discussion of software tools for remote meetings, the calendar and working methods were shortly presented.

WRC- 23 related matters

Document [5C/25](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0025) (IRAN) – See discussion for Document [5C/26](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0026).

Document [5C/26](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0026) (Director) is the approved output of CVC, triggered by the framework document presented by Iran at the last CVC). The document is intended to reflect a common agreement and understanding applicable across all Working Parties, to be used as guidance to all the activities related to WRC-23 in ITU-R groups, with the aim of harmonizing as much as possible the work of each group.

Guidelines/framework considers various aspects, such as new bands and bands already allocated, identification of services, consideration of existing Recommendations/Reports when discussing proposals for new deliverables, decisions of previous WRC, coordination with other WPs. It is specified that the principles do not supersede in any way Resolutions ITU-R 1-8 and ITU-R 2-8, which remain the reference for preparation of studies and deliverables. Document was duly considered.

In order to facilitate studies, membership are invited to provide characteristics and protection criteria where applicable for radiocommunication systems operating and intended to operate in the future in the frequency band subject to WRC-23 agenda items. A specific note has been inserted in the related liaisons addressed to responsible groups.

Liaison activity: No activity at this meeting at plenary level

Work organization

*Input documents*: Document [5C/3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0003) (WP 5A Chair) – WP 5C in copy – contains information about workplan for WRC-23 related activities involving WP 5A, with particular focus on items where WP 5A is responsible. Complete list of WRC-23 AIs is included. The document was noted.

Joint WP 5A-5C activities

After analyzing the available inputs on possible activities involving items under joint responsibility, WPs 5A and 5C Chairmen agreed to have a joint session at this meeting, in order to address WRC‑23 agenda item 9.1 topic c and Resolution ITU-R 59-2.

Section 11 of this document provides an overview of the Joint activity. Further information can be found in the WP 5A Chairman’s Report (Document [5A/85](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5A-C-0085)).

## 3.3 Output documents and other annexes

No deliverable has been produced in relation with the topics addressed in the opening plenary.

# 4 Additional items

Attention was given to possibility to possibly improve the efficiency of electronic meetings.

Opinion was expressed by one Administration that the option of possibly avoiding parallel meetings of WPs 5A, 5B, 5C should be considered and, in case parallel meetings cannot be avoided, proper joint activity to be held between WPs, in order to optimize the avoid duplication of some activity, such as introduction of docs.

# 5 Future meetings

ITU-R WP 5C Meeting #24 will be held in from 4 to 13 November 2020 and is currently foreseen in Geneva. More details of meeting time allocation, as well as the information related to the possibility that the meeting could again be held remotely, due to the evolution of the pandemic, will be given by proper circular letters. Concerning ITU-R SG 5, it was reminded that 2020 SG 5 meeting would be held in July 31, immediately after the WP 5A-5B-5C meetings.

# 6 Closing

The Chairman thanked the participants for their contributions and the spirit of cooperation during the meeting, and for their understanding for facing the difficulties due to a remote meeting.

Particular thanks were expressed to delegates accepting the burden to work during uncomfortable hours due to their geographical location.

Special thanks were given to the Chairmen of WGs for their continuous and valuable support during the meeting, especially for the preparation work before the meeting, such as preparing drafting liaisons and to leaders of drafting activities for the hard work and passion. Sincere thanks were expressed to BR staff, Mr Sergio Buonomo, Mr Botha, Mr Löwenstein and the assistants, for the support during the meeting.

Finally, the Chairman invited all delegates to attend the WP 5C November 2020 meetings in Geneva and closed the meeting.

**Working groups activities**

# 7 Working Group 5C-1 – Spectrum at or below 3 GHz

Chairman: Dr. Brian Patten, (USA)

*Input documents*: 18 (+ 4 Annexes); output documents: 8 ( 4 Annexes).

*Meeting results:* progress was made on activities aimed to development new Reports ITU-R F.[CSA] and ITU-R F.[HF ENVIRONMENT], which were elevated to PDN, Handbook ITU-R [HF Adaptive Handbook] was also progressed.

A Reply liaison was agreed to be sent to WP 1A on HF Electromagnetic Environment.

A Reply liaison, providing characteristics and protection criteria for Fixed Wireless Systems, were sent to WP 5D (AI 1.4), WP7C (AI 1.12) and WP 4C (AI 1.18).

In addition, WG 5C-1 considered inputs from other groups.

## 7.1 Input documents presentation and discussions

**HF Adaptive Handbook**

*Highlights*: An amended working document towards a preliminary draft new Handbook ITU-R [HF Adaptive Handbook] was agreed to be retained in the Chairman’s Report of July 2020 meeting as Annex 1.

*Reference:* Document [5C/648 (Annex 1](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N01%21MSW-E.docx)) contains reference text of a WD towards a PDN Handbook ITU-R [HF ADAPTIVE HANDBOOK], as output from WP 5C meeting No. 22 (April-May 2019).

*Input documents:* Document [5C/43](https://www.itu.int/md/R19-WP5C-C-0043/en) (China) proposes additional text to Chapter 2 (frequency management, DFS) and Chapter 4 (monitoring) of reference document.

Proposals were agreed and a new draft will be attached to the Chairman’s Report of the 23rd meeting of WP 5C as Annex 1, maintaining the status of a WD, as several sections of the document still need input contributions.

*Previous meetings inputs:* see Document [5C/648](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21%21MSW-E.docx)

[Question 258/5](https://www.itu.int/pub/R-QUE-SG05.258) (**HF ENV)**

*Highlights*: An improved version of the document was agreed, and the status of the document was elevated to PDN Report ITU-R F.[HF ENVIRONMENT].

*References:* Document [[5C/648 Annex 4](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N04%21MSW-E.docx)](https://www.itu.int/md/dologin_md.asp?lang=en&id=R15-WP5C-C-0292!N13!MSW-E) contains the working document of PDN Report ITU-R F.[HF ENVIRONMENT], as output from WP 5C meeting No. 22 (April-May 2019).

*Input documents*: Document [5C/45](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0045)(China) proposes amendments to the reference document, based on discussion of May 2019 meeting. Proposals were agreed and the document as amended, and WG-1 proposed that its status be elevated to “PDN Report”, given the document’s maturity. A new version will be attached to the Chairman’s Report of the 23rd meeting of WP 5C as Annex 1.

WP 5C agreed on proposed elevation of status.

*Previous meetings inputs:* see Document [5C/648](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21%21MSW-E.docx)

Unwanted emissions

*Highlights*: A Liaison statement was sent to WP 1A to inform on the results of discussion, confirming the willingness to cooperate and asking for any update. No recommendation will be developed by WP 5C.

*References:* Document [[5C/648 Annex 3](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N03%21MSW-E.docx)](https://www.itu.int/md/dologin_md.asp?lang=en&id=R15-WP5C-C-0292!N13!MSW-E) contains possible elements towards a proposed Recommendation on principles and approaches of constraining unwanted emissions for improving HF electromagnetic environment, as output from WP 5C meeting No. 22 (April-May 2019).

Input documents:

Document [**5C/657**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0657) **(**WP 1A) is a reply to WP 5C liaison from May 2019 meeting on principles and approaches of limiting Unwanted Emissions for Improving HF Electromagnetic Environment, sent by the 2019 meeting. The document confirms that in the case of HF, this topic falls within WP 1A’s purview, and asks to continuing cooperation. The document also encourages contributions on the matter.

*Discussion*. The document was considered and meeting agreed that WP 5C will not develop any specific Recommendation, but intends to support WP 5A, should any information be available.

WG 5C-1 also expressed interest in in possibly developing this material into a report on HF unwanted emissions the fixed service. Reference material was not revised and will be carrier forward to be retained in the Chairman’s Report of WP 5C 23th meeting as Annex 3.

ITU-R F.[CSA]-central alarm system

*Highlights:* An amendment of the document was agreed, based on a US proposal, and the status of document was elevated from WD to PD with the intention to send it to SG 5 at the next WP 5C meeting. New document was annexed to the Chairman’s Report.

References: Document [[[5C/648 (Annex 5](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N05%21MSW-E.docx)](https://www.itu.int/md/dologin_md.asp?lang=en&id=R15-WP5C-C-0292!N13!MSW-E))](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0617%21N05%21MSW-E.docx) contains the reference text of WD towards PDN Report ITU-R F.[CSA], as output from WP 5C meeting No. 22 (April-May 2019).

*Input document*: Document [5C/33](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0033) (United States) provides amendments to the reference text, proposing to elevate the status of this deliverable to PD, given the maturity of document, with the aim to send it, at the next meeting of WP 5C, as a DN Report to SG 5 for approval. New version will be attached to the Chairman’s Report of the 23rd meeting of WP 5C as Annex 7.

WP 5C agreed on the proposed elevation of status.

*Previous meetings inputs:* see Document [5C/648](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21%21MSW-E.docx)

WRC-23 related activities

***Agenda item 1.4*** (high-altitude platform stations as IMT base stations (HIBS) in the mobile service in frequency bands below 2.7 GHz already identified for IMT-Resolution 247)

*Highlights:* a reply LS was prepared to WP 5D

*Input documents:* Document [5C/9](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0009) (WP 5D) is a liaison statement, as responsible group for WRC-23 agenda item 1.4, to WP 5C and all contributing groups, requesting information on technical and operational characteristics, protection criteria, include any methodology on how to apply it, or performance objectives, as appropriate, for applications of relevance to each WP. WRC AI 1.4 considers the use of high-altitude platform stations as IMT base stations (HIBS) in the mobile service in certain frequency bands below 2.7 GHz already identified for IMT (frequency bands 694‑960 MHz, 1 710-1 885 MHz and 2 500-2 690 MHz).

A text for a draft reply liaison, prepared before meeting by the WG C1 Chairman, was discussed and agreed.

***Agenda item 1.5*** (review the spectrum use and spectrum needs of existing services in 470-960 MHz in possible regulatory actions in the frequency band 470‑694 MHz in Region 1 (Resolution **235**)

*Highlights:* No action was deemed necessary at this meeting

*Input documents:*

Document [5C/6](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0006) (WP 6A) is a liaison statement to WP 5A (WP 5C in copy), providing information about deliverables addressing applications ancillary to broadcasting and programme-making (SAB/SAP) , intended to assist WP 5A in relation with activities addressing applications in 470‑694 MHz range, as requested by AI 1.5, since an allocation as secondary service exists for the land mobile service, intended for (SAB/SAP).

Document [5C/7](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0007) (WP 6A) is a liaison statement to TG 6/1 (WP 5C in copy), informing that WP 6A is undertaking a review of BT-series ITU-R Reports and Recommendations within its remit to ensure they contain the most up-to-date information for use by TG 6/1, and that related information will be provided not later than the due date of 15 May 2021.

The two documents were noted.

Resolution ITU-R 59-2 - PMSE

*Highlights:* discussion was held on a joint session with WP 5A; no action was deemed necessary at this meeting from WG 5C-1. More information is available in section 11 of this document.

***Agenda item 1.12*** (New secondary allocation to the EESS (active) for spaceborne radar sounders within frequencies around 45 MHz*-*Resolution **656**)

*Highlights:* a LS was prepared to WP 7C

*Input documents:* Document [5C/15](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0015) (WP 7C) is a liaison, from the responsible group for WRC-23 agenda item 1.12, to WPs 5A, 5C and 6A, asking for information on technical and operational characteristics, protection criteria in relation with this agenda item.

A text for a draft reply liaison statement, prepared before the meeting by the WG C1 Chairman, was discussed and agreed.

***Agenda item 1.18*** (Spectrum needs and potential new allocations to (MSS) for future development of narrowband mobile-satellite systems*-Resolution* ***248***)

*Highlights:* a LS was prepared to WP 4C.

*Input documents:* Document [5C/21](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0021) (WP 4C) is a liaison statement, from the responsible group for WRC-23 1.18, requesting relevant information, including technical and operational characteristics and protection criteria for their respective services allocated in, or adjacent to, the frequency bands 1 695-1 710 MHz, 2 010-2 025 MHz, 3 300-3 315 MHz and 3385-3 400 MHz, to support the required sharing and compatibility studies to be carried out within WP 4C.

A text for a draft reply liaison, prepared before meeting by the WG C1 Chairman, was discussed and agreed.

**Ionospheric sounders (<50 MHz)**: No action was deemed necessary at this meeting.

*Input documents:* Document [**5C/651**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0651) **(**WP 3L) is a liaison to WP 7C, 5C, answering some questions raised by WP 7C about technical characteristics and related deliverables from WP 3L, concerning ionospheric sounders used for space weather remote sensing. The document was noted.

***Gfast /Mgfast***: No action was deemed necessary at this meeting.

*Input documents:* Document [**5C/659**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0659) **(**WP 1A) is a reply liaison statement to ITU-T SG15, sent for information to several groups including WP 5C, addressing, in addition to progress of the ANT and HNT, the technical discussions that took place on the measures available in *G.fast* and *G.mgfast* specifications for guarding against interference to radiocommunication services. Desire for continuation of cooperation is expressed. The document was noted.

**Sharing MSS 2.6 GHz:** No action was deemed necessary at this meeting.

*Input documents:* Document[**5C/661**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0661) **(**WP 4C) is a liaison statement to inform WP 5D that work on a report on sharing and coexistence studies between the mobile-satellite service and terrestrial IMT systems in the band 2 655-2 690 MHz has been initiated. The document reminds that, with the increasing deployment of terrestrial IMT systems in many countries in the last couple of years, harmful interference to the MSS in this band has been reported. The document was noted.

***Non-GSO 1-3 GHz range***

Highlights: No action was deemed necessary at this meeting.

*Input document:* Document [**5C/662**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0662) **(**WP 4C) is a liaison statement informing WPs 5A, 5C, 7B, 7C and 7D on the development of a WD towards a PDN Report ITU-R M.[NGSO\_SPACE-TO-SPACE\_MSS], addressing non-geostationary satellites operating space-to-space links in the mobile‑satellite service (MSS) allocations in the 1-3 GHz range. The document was noted.

*Mobile Satellites and IMT in 2 655-2 690 MHz range*

*Highlights*: No action was deemed necessary at this meeting.

*Input document:* Document [5C/8](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0008) (WP 5D) is a liaison statement to WP 4C, providing information about sharing and coexistence studies between the mobile-satellite service and terrestrial IMT systems in the 2 655-2 690 MHz frequency band. The documents remind about recent decisions in WRC-19 to undertake activities to address this topic and suggests a joint coordination to develop activities. The document was noted.

## 7.2 WG 5C-1 Output documents

*Deliverables presented to September 2019 SG 5 for approval*: None

*Deliverables approved by WP 5C Plenary*:

– Reply liaison to WP 1A on Principles and Approaches of Limiting Unwanted Emissions for Improving HF Electromagnetic Environment, informing that WP 5C has decided not to develop an F-series recommendation on this subject, (Document 5C/TEMP/10): to become Document [1A/28](https://www.itu.int/md/R19-WP1A-C-0028/en).

– Reply liaison statement to WP 5D, in support of studies for WRC-23 agenda item 1.4, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in certain frequency bands below 2.7 GHz already identified for IMT (Document 5C/TEMP/4): to become Document [5D/234](https://www.itu.int/md/R19-WP5D-C-0234/en).

– Reply liaison statement to WP 7C, in support of studies for WRC-23 agenda item 1.12, addressing technical and operational characteristics, as well as protection criteria (Document 5C/TEMP/5): to become Document [7C/37](https://www.itu.int/md/R19-WP7C-C-0037/en).

– Reply liaison statement to WP 4C, in support of studies for WRC-23 agenda item 1.18, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in certain frequency bands up to 3 400 MHz under study in this agenda item. (Document 5C/TEMP/6): to become Document [4C/44](https://www.itu.int/md/R19-WP4C-C-0044/en).

– PDN Rep ITU-R F.[CSA] - WP 5C approved the elevation of status from WD to PD. Document (Document 5C/TEMP/7): to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N05%21MSW-E.docx) Annex 5.

Deliverables annexed to Chairman’s Report:

– WD towards a PDN Handbook ITU-R [HF ADAPTIVE HANDBOOK] (Document 5C/TEMP/8) - to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N01%21MSW-E.docx) Annex 1.

– PDN Rep ITU-R F.[HF ENVIRONMENT] (Document 5C/TEMP/9) - to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N04%21MSW-E.docx) Annex 4.

Deliverables retained in Chairman’s Report:

– Elements towards a proposed Recommendation ITU-R [HF Unwanted] on principles and approaches of constraining unwanted emissions for improving HF electromagnetic environment - (Document 5C/TEMP/11): to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N03%21MSW-E.docx) Annex 3.

# 8 Working Group 5C-2 – Spectrum frequencies higher than 3 GHz up to 86 GHz

Chairman: Mr. Nasarat Ali (U.K.)

*Input documents:* 25 (+ 4 Annexes); output documents: 10(+ 6 Annexes)

*Meeting results:* Proposals to start activities aimed to revise Recommendations ITU-R F.595-10 and ITU-R F.749 to increase the maximum channel BW, allowing wide channels, have been agreed. Progress was made on revision of Recommendations ITU-R F.383-9 and ITU-R F.637-4.

Reply liaisons were approved to WP 5D (agenda item 1.2), WP 7B (agenda item 1.13), WP 4A (agenda items1.15, 1.16, 1.17, 1.19), to provide them with technical and operational characteristics of FS for sharing and compatibility studies.

In addition, WG 5C-2 considered the inputs from other groups. Few documents (Documents [5C/52](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0052), [5C/656](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0656)**,** [5C/647](https://www.itu.int/md/R15-WP5C-C-0647/en) and [5C/663](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.itu.int%2Fmd%2Fmeetingdoc.asp%3Flang%3Den%26parent%3DR15-WP5C-C-0663&data=02%7C01%7CNasarat.Ali%40ofcom.org.uk%7C000446360969455cc04008d833461692%7C0af648de310c40688ae4f9418bae24cc%7C0%7C0%7C637315723461349113&sdata=NSYfry6Q0FmeIMU8E6UN%2FXQko%2B3oqdlBMlvtp9SoIOQ%3D&reserved=0)) will be carried on to next meeting, due to lack of time.

## 8.1 Input documents presentations and discussions

*Channel arrangement*

Highlights : proposals to start a revision of Recommendations ITU-R F.595-10 and ITU.R F.479, have been agreed and related WDs have been agreed to be annexed to the Chairman’s Report of the 23rd meeting of WP 5C; status of documents addressing revision of Recommendations ITU-R F.383-9 and ITU-R F.637-4 were elevated to PDR.

*Recommendation ITU-R F.383-9*

*Highlights:* Document was amended and its status was elevated to PDR.

References: Document [5C/648 (Annex 7](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N07%21MSW-E.docx)) contains reference text of WD towards a PDR of Recommendation ITU-R F.383-9 (channel arrangements in the lower 6 GHz (5 925 to 6 425 MHz) band), including a new 59.3 MHz channel BW, as output from WP 5C meeting No. 22 (April‑May 2019).

*Input documents*: Document [5C/37](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0037) (Canada) proposed some updated at the text reference, for better understanding and alignment, asking to elevate the status to PDR, given the document’s maturity. Proposals were accepted by WG 5C-2. New version will be attached to the Chairman’s Report of the 23rd meeting of WP 5C as Annex 7.

WP 5C agreed on proposed elevation of status.

*Recommendation ITU-R F.637-4:*

*Highlights:* Document was amended and its status was elevated to PDR.

*References:* Document [5C/648 (Annex 8](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N08%21MSW-E.docx)) contains draft text of WD towards a PDR of Recommendation ITU-R F.637-4 (channel arrangement in 21.2-23.6 GHz),including a new 224 MHz channel BW, as output from WP 5C meeting No. 22 (April-May 2019).

*Input documents:* Document [5C/44](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0044) (Huawei) proposes some amendments to reference text, especially for better understanding of figures, and the elevation of status of text, so amended, from WD to PDR, given the document’ s maturity. Proposals were accepted by WG 5C-2. New version will be attached to the Chairman’s Report of the 23rd meeting of WP 5C as Annex 7.

WP 5C agreed on proposed elevation of status.

*Recommendation ITU-R F.1520-3*: No input at this meeting.

*References:* Document [5C/648 (Annex 9](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N09%21MSW-E.docx)) contains draft text of WD towards a PDR of Recommendation ITU-R F.1520-3 (channel arrangement in 31.8-33.4 GHz),including a new 224 MHz channel BW, as output from WP 5C meeting No. 22 (April-May 2019). The document will be attached to to the Chairman’s Report of the 23rd meeting of WP 5C without any change.

*Recommendation ITU-R F.2005-4:* No input at this meeting.

*References:* Document [5C/648 (Annex 10](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N10%21MSW-E.docx)) contains draft text of WD towards a PDR of Recommendation ITU-R F.2005-4 (channel arrangement in 40.5-43.5 GHz) ,including a new 224 MHz channel BW, as output from WP 5C meeting No. 22 (April-May 2019). The document will be attached to to the Chairman’s Report of the 23rd meeting of WP 5C without any change.

*Recommendations ITU-R F.595-10 (18 GHz) / ITU-R F.749-3 (38 GHz)*

*Highlights:* Proposals have been agreed and two new working documents have been annexed to Chairman’s Report.

Document [5C/4](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0004) **(France, on behalf of CEPT)** asks WP 5C to revise Recommendation ITU-R F.595-10 for 18 GHz band to introduce a new channel plan of 220 MHz BW channels, according to the philosophy of having “interleaved pattern” for those largest channels (as already used in other
ITU-R recommendations), with the same duplexer as the narrow channels..

The proposal is in line with the trend to make wide channels available to satisfy the very high capacity demand for needs of IMT backhauling.

This new channel plan complements the existing 220 MHz channel plan, where the duplexer is different from narrower channels just for this channel spacing.

Following same needs, the document also asks WP 5C to s tart revision of Recommendation ITU‑R F.749-3, for the 38 GHz band, to add a 224 MHz channel plan, where each new channel occupies two consecutive slots of existing 112 MHz channels.

Information is contained that both proposed channel plans are already used in CEPT.

*Information from CEPT*

*Input documents:* Document [**5C/664**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0664) **(Russian Federation, in agreement with CEPT)** informs WP 5C on the approval of some Recommendations including wide channel arrangements, as follows: ERC Recommendation 12-06 (10.7-11.7 GHz), ERC Recommendation 12-03 (17.7‑19.7 GHz), Recommendation T/R 13-02 (22.0-29.5 GHz), ERC Recommendation (01)02 (31.8-33.4 GHz), Recommendation T/R 12-01(37-39.5 GHz).

*Discussion on channel arrangement:*

The proposal to start activities aimed to revise Recommendations ITU.R F.595-10 and ITU-R F.749-3, in line with the concept of allowing wider channels than the ones foreseen today, was agreed. Such activity, which has been undertaken also for other Recommendations under responsibility of WP 5C, is intended to facilitate answering the needs of the evolving networks, such as the requirement of a significant increase of microwave transmission capacity.

Deliverables related to wide channel activities not having received inputs at this meeting were agreed to be retained in the Chairman’s Report to be carried forward to the next WP 5C plenary.

*Previous meetings inputs*: see Document [5C/648](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21%21MSW-E.docx)

***71-76 and 81-86 GHz***

*Highlights:* No output was deemed necessary at this meeting; discussion will be continued at next WP 5C meeting.

*Input documents:* Document [5C/52](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0052) **(United Kingdom) addresses** sharing conditions between fixed service and satellite services in the 71-76 GHz and 81-86 GHz bands. Considering the technological developments, the strategically importance for high capacity backhaul fixed links, including 5G fronthaul and backhaul, the availability of characteristics of fixed service systems as well as the increase in number of satellite filings in these frequency bands, it is proposed to send a request for information on satellite use in 71-76/81-86 GHz bands from WPs 4A and 4C, and to start study of a new ITU-R Report for the development of sharing conditions between fixed service and satellite services in the 71-76 GHz and 81-86 GHz bands (WD and proposed draft liaison are attached).

*Discussion*: the topic of addressing study of sharing between the FS and satellite was commented by some administrations, and some support for possible consideration was given. It was noted that the activity could be given more insight, including the sharing scenarios to be studied, and allow time to gather more information. On the issue, a proposal to prepare a work plan found support from some administrations. Having considering all of that, decision was taken to carry forward the document to next meeting of WP 5C, where further discussion could be continued, possibly taken benefit from additional info, as conveyed by new contributions.

*WRC-23 agenda items*

*Highlights:* Liaisons were sent to WP 5D for AI 1.2, WP 7B for AI 1.13, to WP 4A for AI 1.15, AI 1.16, AI 1.17, and AI I.19; discussion was held (see below) on a common approach for answering.

***Agenda item 1.1*** (*Protection of stations of the aeronautical and maritime mobile services located in international airspace and waters in frequency band 4 800-4 990 MHz, Resolution* ***223)***

*Highlights:* No action were deemed necessary at the meeting*.*

*Input documents:* Document [5C/12](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0012) (WP 5D) is a liaison statement, as responsible group for WRC‑23 agenda item 1.1, to contributing groups, requesting WP5B, in particular, to provide information on the characteristics and protection criteria for stations of the aeronautical and maritime mobile services located in international airspace and in international waters, operating in the frequency band 4 800‑4 990 MHz, to be used for IMT- related studies. Other groups are addressed for information and action, if any. The document was noted.

***Agenda item 1.2*** (Identification of the frequency bands 3 300-3 400 MHz, 3 600‑3 800 MHz, 6 425‑7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for (IMT) - Resolution **245** **(WRC‑19)**)

*Highlights*: A reply LS was prepared to WP 5D

*Input documents:*

Document [5C/10](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0010) (WP 5D) is a liaison, as responsible group for WRC-23 AI 1.2, to all contributing groups, including WP 5C, asking information on technical and operational characteristics, protection criteria (which may include any methodology on how to apply it or performance objectives, as appropriate), with respect to systems operating in the frequency bands 3 300-3 400 MHz, 3 600‑3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz and adjacent frequency bands, as appropriate. Answer is needed before 15 June 2021, at latest.

Document [5C/11](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0011) (WP 5D) is a liaison, as responsible group for WRC-23 AI 1.2, to SG3, discussing 4 different scenarios for IMT (Indoor, Urban, Suburban and Rural), asking information about the suitable model for use on ground-to-ground, ground-to-aeronautical, and Earth-to-space, including building entry loss models. Information is needed not later than 15 June 2021.

Document [5C/39](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0039) (Russia) provides background information related to the frequency bands from 6 425 to 7 125 MHz, informing that, in the Russian Federation, the range 6 425-7 125 MHz are mainly used for the organization of backhaul links between cities, with most of the stations being located in rural areas or in small towns (suburbs). A comparison of the FS systems characteristics specified in Recommendation ITU-R F.758-7 with the characteristics of the existing FS systems used in the these bands shows that, based on Recommendation ITU-R F.758-7, it is possible to determine the typical characteristics of the FS stations, most closely reflecting the actual use of the FS in the band 6 425-7 125 MHz. The text of a possible draft reply liaison statement to WP 5D on AI 1.2 WRC-23, containing information on typical technical characteristics and protection criteria for fixed service systems, is included.

Document [5C/46](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0046) (Huawei Sweden) provides a table showing typical values of some equipment parameters, derived from ECC report 173 & ECC Report 302 and combined with deployment experience, showing comparison, for some parameters, in frequency band 6 425-7 125 MHz, between the values used in rural and urban applications and the current values in Recommendation ITU-R F.758-7. The values are given to be considered in the liaison to WP 5D to assist in case there is the need to consider different deployment scenarios. Text of a proposed draft reply liaison is included. The document also proposes to include the table in next revision of Recommendation ITU-R F.758-7.

***Agenda item 1.13***(Upgrade the allocation of 14.8-15.35 GHz to the space research service*-* Resolution **661** (**WRC‑19**)

*Highlights:* A reply LS was prepared to WP 7B

*Input documents:*

Document [5C/14](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0014) (WP 7B) is a liaison statement, as responsible group for WRC-23 AI 1.13, to contributing groups, including WP 5C, asking information about technical and operational characteristics of the systems under their purview operating in the 14.8-15.35 GHz frequency band. Answer is expected before 15 December 2020.

Document [5C/34](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0034) (USA) proposes a reply liaison statement to Working Party 7B on technical and operational characteristics, and protection criteria of the fixed service in the frequency band 14.8‑15.35 GHz in order to undertake studies on WRC-23 agenda item 1.13

***Agenda item 1.15*** *(*harmonize use of 12.75-13.25 GHz by earth stations on vessels to space stations in the FSS*- Resolution* ***172 (WRC‑19)***)

*Highlights:* A reply LS was prepared to WP 4A

*Input documents:*

Document [5C/19](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0019) (WP 4A) is a liaison statement, as responsible group for WRC-23 AI 1.15, to WPs 5A and 5B, (WP 5C for information), asking relevant information, including technical and operational characteristics and protection criteria for current and planned MS stations in, or adjacent to, the frequency band 12.75-13.25 GHz, to support the required sharing and compatibility studies. The document was noted.

Document [5C/20](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0020) (WP 4A) is a liaison statement, as responsible group for WRC-23 AI 1.15, to WP 5C, asking confirmation on the appropriateness of technical and operational characteristics and the protection criteria for current and planned FS stations in, or adjacent to, the 12.75-13.25 GHz frequency band, contained in Recommendation ITU-R F.758-7, and specifically Table 8 of Annex 2, are the ones to be used support the required sharing and compatibility studies.

Document [5C/35](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0035) (USA) proposes a reply liaison statement to Working Party 4A on technical and operational characteristics, and protection criteria of the fixed service in the 12.75-13.25 GHz band in order to undertake studies on WRC-23 agenda item 1.15. It is noted that the characterization of parameters in Annex 2 is partially incomplete for this frequency range, so the indication that Annex 3 can be used is contained.

Document [5C/53](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0053) (United Kingdom) proposes a reply liaison statement to Working Party 4A on technical and operational characteristics, and protection criteria of the fixed service in the 12.75‑13.25 GHz band in order to undertake studies on WRC-23 agenda item 1.15. Authors note that some parameters listed in Annex 2 Table 8 are partially or completely unavailable, and the ones given in Annex 3 Table 18 for the 12.75-13.25 GHz band are no longer representative of current systems deployed in this band in the United Kingdom and Europe. According to this an updated set of parameters is proposed for the liaison. Insertion of these values in a revision of Recommendation ITU-R F.758-7 is also proposed.

***Agenda item 1.16*** (use of some frequency bands from 17.7 GHz to 30 GHz (Earth-to-space) by non-GSO FSS ESIM, ensuring protection to existing services - Resolution **173 (WRC-19)**)

*Highlights:* a reply LS was prepared to WP 4A.

*Input documents:* Document [5C/23](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0023) (WP 4A) is a liaison statement, as responsible group for WRC‑23 agenda item 1.16, to contributing Working Parties responsible for existing primary services to be protected, including WP 5C.

Document requests contributing groups to provide their relevant information, including technical and operational characteristics and protection criteria for their respective services allocated in, or adjacent to, the frequency bands 17.7‑18.6 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, 27.5-29.1 GHz and 29.5-30 GHz.

***Agenda item 1.17*** (provision of inter‑satellite links in specific frequency bands, new ISS allocation Resolution **773 (WRC/19**))

*Highlights*: a reply LS was prepared to WP 4A

*Input documents:* Document [5C/22](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0022) (WP 4A) is a liaison statement, as responsible group for WRC‑23 agenda item 1.17, to contributing Working Parties responsible for existing primary services to be protected, including WP 5C.

WP 5C is requested to provide relevant information, including technical and operational characteristics and protection criteria for FS allocated in, or adjacent to, the frequency bands 11.7‑12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz. Contributing WPs will be kept informed on developments of this AI.

***Agenda item 1.19*** (new primary allocation to the fixed-satellite service in the space-to-Earth direction in the frequency band 17.3-17.7 GHz in Region 2 - Resolution **174 (WRC-19)**)

*Highlights:* a reply LS was prepared to WP 4A

*Input documents:* Document [5C/24](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0024) (WP 4A) is a liaison statement, as responsible group for WRC‑23 AI 1.19, to contributing Working Parties responsible for existing primary services to be protected, including WP 5C.

WP 5C is requested to provide their relevant information, including technical and operational characteristics and protection criteria for FS, which is primarily allocated adjacent to the frequency band 17.3-17.7 GHz. WP 5C will be kept informed on developments.

***WRC – General***

Document [5C/47](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0047) (Telephone AB – LM Ericsson) provides a set of values / ranges about some equipment parameters, in several frequency ranges from 6 to 27 GHz bands, which were taken from Recommendation ITU-R F.758-7 as a starting point, but then modified to reflect current installations, to be used for the activities related to WRC-23 AIs, in case the need to suggest some typical values for sharing and coexistence studies is raised. A set of values is also included for rural and urban areas, in relation with frequency band 6 425-7 125 MHz.

The document also proposes to include the table in a next revision of Recommendation ITU-R F.758-7.

Discussion on agenda items

General discussion was held on the possibility to include material derived from input document in liaison, to be used in sharing studies. Different opinions were expressed, but several participants were not in favor, since the indication of values not sufficiently consolidated by the group could generate misunderstanding and possible doubts about the stability of existing deliverables (such as Recommendation ITU-R F.758). Opinions were also expressed that, once consolidated, such values should preferably be inserted in Recommendation ITU-R F.758. Discussion was also addressed at typical values, where it was noted that, depending on country and deployment scenarios, different values could be used, so agreement is needed.

It was also noted that, in some cases, when a wide range of values is given in Recommendation ITU-R F.758 for some parameter; the possibility to indicate a narrower range for sharing studies could also be the considered, since the results of studies could be significantly different, depending on which value of the parameter is used in the range.

It was also noted that deadline for most reply is June 2021, so additional information could also be prepared at next meeting with a view to providing updated replies to other groups.

A note inviting the membership to provide characteristics and protection criteria for radiocommunication systems operating and intended to operate in the future in the frequency bands subject to WRC-23 was inserted in all liaisons.

Further information of discussion related to Recommendation ITU-R F.758 can be find in WG 4 specific section.

***ESIM***

*Highlights:* No action was deemed necessary

*Input documents:*

Document [5C/650](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0650) (WP 5A) is an answer liaison statement to WP 4A (WP 5C in copy) informing on development of DNRec. ITU-R M.[MS-RXCHAR-28], “Receiver characteristics and protection criteria for systems (excluding IMT) in the mobile service in the frequency range 27.5-29.5 GHz for use in sharing and compatibility studies”. The document was noted.

Document [5C/663](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0663) (WP 4A) is a liaison statement to WP 5C in copy informing on development of a PDNRep ITU-R S.[LESIM-FS] “Statistical methodologies to estimate the interference from land earth stations in motion (L-ESIM) communicating with geostationary space stations in the fixed‑satellite service into fixed service (FS) stations operating in the frequency band 27.5-29.5 GHz” document informs that comments received from WP 5C have been taken into account. The document was not discussed due to lack of time; it will be carried forward to next meeting.

***6-40 GHz Radio services protection***

*Highlights:* No discussion due to time restriction.

*Input documents:*

Document [**5C/656**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0656) **(**WP 1A) asks for receiving information about radio services and their characteristics in the 6-40 GHz frequency range, following a CISPR activity to extend emission requirement and measurements from current upper limit of 6 GHz till 40 GHz. The requested information will assist CISRP in in providing further input for its database for the protection of radio services.

The document was not discussed due to lack of time; it will be carried forward to next meeting.

***WRC-19 AI. 1.7*** *(non GSO Satellite short duration)*

*Highlights:* No discussion due to time restriction.

*Input Documents:* Document [**5C/647**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0647) **(**WP 5B) is a reply liaison to WP 7B (5C in copy) including considerations on compatibility of systems operating in the AM(R)S below 137 MHz with non‑GSO short duration satellite systems in 137-138 MHz operating under the space operation service.

The document was not discussed due to lack of time; it will be carried forward to next meeting.

## 8.2 WG 5C-2 Output documents

*Deliverables agreed to be presented to September 2019 SG 5 for approval*: none

*Deliverables approved by WP 5C Plenary*:

– Liaison statement to WP 5D, in support of studies for WRC-23 AI 1.2, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in the frequency bands between 3 300 MHz and 10.5 GHz considered in this AI (Document 5C/TEMP/15): to become Document [5D/233](https://www.itu.int/md/R19-WP5D-C-0233/en).

– Liaison statement to WP 7B, in support of studies for WRC-23 AI 1.13, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in the frequency bands subject to WRC-23 agenda item 1.13. (Document 5C/TEMP/16): to become Document [7B/31](https://www.itu.int/md/R19-WP7B-C-0031/en).

– Liaison statement to WP 4A, in support of studies for WRC-23 AI 1.15, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in the frequency band 14.8-15.35 GHz (Document 5C/TEMP/17): to become Document [4A/47](https://www.itu.int/md/R19-WP4A-C-0047/en).

– Liaison statement to WP 4A, in support of studies for WRC-23 AI 1.16, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in some frequency bands from 17.7 GHz to 30 GHz. (Document 5C/TEMP/20): to become Document [4A/45](https://www.itu.int/md/R19-WP4A-C-0045/en).

– Liaison statement to WP 4A, in support of studies for WRC-23 AI 1.17, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in the 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz. (Document 5C/TEMP/21): to become Document [4A/46](https://www.itu.int/md/R19-WP4A-C-0046/en).

– Liaison statement to WP 4A, in support of studies for WRC-23 AI 1.19, addressing technical and operational characteristics, as well as protection criteria, for Fixed Wireless systems operating in the 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz. (Document 5C/TEMP/24): to become Document [4A/44](https://www.itu.int/md/R19-WP4A-C-0044/en).

*Deliverables to be annexed to Chairman’s Report:*

– WD towards a PDNR of Recommendation ITU.R. F.595-10 (18 GHz) (Document 5C/TEMP/22): to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N13%21MSW-E.docx) (Annex 13).

– WD towards a PDNR of Recommendation ITU.R. F.749-3 (38 GHz) (Document 5C/TEMP/23) - to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N12%21MSW-E.docx) (Annex 12).

– PDR of Recommendation ITU-R F.383-9 (5 925 – 6 425 MHz) (Document 5C/TEMP/25) - to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N07%21MSW-E.docx) (Annex 7).

– PDR of Recommendation ITU-R F.637-4 (21.2-23.6 GHz)
(Document 5C/TEMP/26) to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N08%21MSW-E.docx) (Annex 8).

*Deliverables to be retained in Chairman’s Report*:

– WD towards a PDR of Recommendation ITU-R F.1520-3 (31.8-33.4 GHz) – to be carried forward without change in Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N09%21MSW-E.docx) (Annex 9).

– WD towards a PDR of Recommendation ITU-R F.2005-4 (40.5-43.5 GHz) – to be carried forward without change in Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N10%21MSW-E.docx) (Annex 10).

# 9 Working Group 5C-3 – Systems in spectrum higher than 86 GHz and interdisciplinary topics

Chairman: Dr Haim Mazar (ATDI)

WG 5C-3 established no specific Draft Groups at this meeting:

*Input documents*: 18 (+ 3 Annexes); output documents: 5 (including 3 Annexes)

*Meeting results:* A reply liaison was sent to WP 7C in relation with AI 1.14, Activity towards a revision of Rec. ITU-R F. 2416-0 was agreed, a liaison was sent to WP7C for cooperation on emissions. new activity to develop new Recommendations for channel plan for frequency bands allocated to FS in the portions of the range 92 GHz to 174.8 GHz already allocated to the fixed service, were discussed and found agreement.

A liaison to WP 7C was also agreed, to receive guidance on protection criteria for the EESS in frequency bands adjacent to the ones addressed by the new proposed Recommendations.

Liaisons were received by other WPs /groups, especially ITU-T and WMO.

The group agreed to carry the other ongoing activities forward to the next WP 5C meeting and considered the inputs from other groups.

## 9.1 Input documents presentation and discussions

***Future revisions of Recommendations-Reports for bands Higher than 275 GHz***

Highlights: WD for revision of Rep. ITU-R F.2416-0 was progressed, a liaison was agree to be sent to WPs 7A, 7B for assistance on EESS.

*References:*

Document [5C/648 Annex 2](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N02%21MSW-E.docx) contains some elements for future revisions of deliverables addressing frequency bands above 275 GHz, as output from WP 5C meeting No. 22 (April-May 2019).

Document [5C/648 Annex 11](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N11%21MSW-E.docx) contains the draft text of a reply liaison to WP 1A addressing updates of activities ongoing on WP 5C for frequency bands above 275 GHz, as output from WP 5C meeting 22 (April-May 2019). – This Material is no more necessary and will not be carried forward.

Document [5C/648 Annex 6](https://www.itu.int/dms_ties/itu-r/md/15/wp5c/c/R15-WP5C-C-0648%21N06%21MSW-E.docx) contains the draft text of WD towards a PDR of Report ITU-R F.2416-0 (Technical and operational characteristics and applications of the point-to-point fixed service applications operating in the frequency band 275-450 GHz), as output from WP 5C meeting No. 22 (April-May 2019).

*Input Documents:*

Document [**5C/658**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0658) **(**WP 1A) is an answer liaison to WPs 3J, 3K, 3M, 5A, 5C, 7C and 7D informing on finalization of DN Rep. ITU-R SM.[275-450GHZ\_SHARING] on “Sharing and compatibility studies between land-mobile, fixed and passive services in the frequency range 275‑450 GHz”. The document was noted.

Document [5C/27](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0027) (Canada) proposes some amendments to reference document in Annex 6 of Chairman’ s Report, to align it to the decisions taken during WRC-19, to address the specific conditions necessary to ensure the protection of Earth exploration-satellite service (passive) applications in the frequency bands 296-306 GHz, 313-318 GHz and 333-356 GHz, to be determined in accordance with [Resolution **731 (Rev.WRC-19)**](https://www.itu.int/oth/R0A060000A1/en).

A draft text for a liaison to be sent to WPs 7A, 7B, to seek collaboration in development of the revision, is also included.

Document [5C/36](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0036) (ETSI TM4) provides some diagrams of calculated and measured antenna pattern at frequencies higher that 86 GHz, together with some information about gain, replying a liaison by WP 5C sent from last WP 5C meeting to gather information useful to revise antenna related documents to allow their use in a wider range , following the technological evolution of the equipment. It is confirmed that, at the moment, limited information is available to ETSI TM4. Document was presented and its content was included in the proposed elements addressing future revision of Recommendation ITU-R F.699.

Recommendation ITU-R F.669

Following material from ETSI, possibility to start activity towards a new revision of Recommendation ITU-R F.699, to extend the upper frequency of application to 450 GHz was considered. Extension to such a limit was not agreed, but support was given to extend the current upper limit of 86 GHz to a higher value. Consideration was expressed to use the upper limit of the frequency range addressed by the proposed new activity above 86 GHz (See Document [5C/29](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0029)).

***Frequency bands 92-174.8 GHz***

*Highlights:* A new activity was proposed at this meeting to consider development of specific deliverables for support the use of the ranges already allocated to the FS from 92 to 174.8 GHz.

Proposal includes the development of two Recommendations, intended to cover the range 92‑114.25 GHz and 130 to 174.8 GHz respectively, as well as a third Recommendation/Report addressing the unwanted emission levels outside the allocated bands for protection of EESS.

A liaison was sent to WP 7C asking confirmation on validity criteria proposed for EESS limits, derived from lower frequencies. Preliminary agreement was expressed towards the channel plan related proposals. The documents will be carried forward to the November 2020 WP 5C meeting, to move to further steps, taking also account of the considerations of WP 7C*.*

New Recommendation ITU-R F.W-band

Document [5C/28](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0028) (France, in agreement with CEPT) asks WP 5C to start the development of a new Recommendation ITU-R F. [W-band] on Radio-frequency channel arrangement for the fixed service in the bands 92-94 GHz, 94.1-100 GHz, 102‑109.5 GHz and 111.8-114.25 GHz, so called W-band, including a proposal for a working document. A basic channel raster of 250 MHz BW is proposed. Information that this document is in line with a CEPT Recommendation already in force is included.

New Recommendation ITU-R F.D-band

Document [5C/29](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0029)(France, in agreement with CEPT) asks WP 5C to start the development of a new Recommendation ITU-R F. [D-band] on Radio-frequency channel arrangement for the fixed service in the bands 130-34 GHz, 141-148.5 GHz, 151.5-164 GHz and 167-174.8 GHz, so called D-band, including a proposal for a working document. A basic channel raster of 250 MHz BW is proposed. Information that this document is in line with a CEPT Recommendation already in force is included.

RF emissions – Unwanted emissions for EESS protection

*Highlights:* A Liaison was sent to WP 7C to receive guidance

Document [5C/30](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0030) (France, in agreement with CEPT) asks WP 5C to start the development of a new Recommendation ITU-R F.[EESS-PROTECTION], intended to establish the unwanted emission levels outside the allocated bands for FS systems operating in bands from 94.1 GHz to 174.8 GHz for the protection of EESS (passive) operating in adjacent bands where RR No. **5.340** applies. The extension of the criteria provided by Resolution 750 to allow covering all frequency range addressed by the proposed new Recommendations ITU-R F.[W-band] and ITU-R F.[D-band] is proposed.

*Discussion:* Several points were discussed in relation to the use of these frequencies. Question was made on the reasons why two single Recommendations are proposed, instead of just one; answers was given that there are significant differences between the two subranges, from the point of view of propagation, technology to be used for equipment, intended use, so that, in the intention of proponents, there is advantage in keeping them separate. Another point raised was the possibility that the new proposed Recommendation for the 92-114.25 GHz is intended to replace current Recommendation ITU-R F.2004, covering the 92-95 GHz band and not widely used due the limited BW available and the consequent technology limitations. It was noted that the proposed solution contains allows both possibilities, a possible decision in this sense could be considered based on inputs. The general need of checking if existing Recommendations/Reports could be used or revised to cover new proposed activities was also reminded.

Concerning the proposed solution to address the protection of EESS frequency ranges adjacent to FS allocated frequency ranges, discussion was widened, to consider additional possible topics to be agreed upon, such as need for compatibility study.

WP 5C could not finalize the analyzes a decision at this meeting, since different views were expressed.

Consensus was expressed that the opinion of WP 7C is necessary to confirm the validity of proposed approach (Use same limits used in band 71 to 86 GHz) or using another one. Possible impact on Resolution 750 was also shortly noted, as well as the possibility that the EESS protection could be covered by a Report, instead of a Recommendation, if needed.

Opinion was also expressed that, should WP 7C confirm the proposed approach, the material contained in Document 5C/30 could be directly included in the texts proposed for the two future Recommendations.

WRC-23 agenda items

***Agenda item 1.14*** (New primary allocations to EESS (passive) in the frequency range 231.5‑252 GHz – Resolution **662 (WRC-19)**)

*Highlights*: a reply LS was prepared to WP 7C

*Input documents*: Document [5C/16](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0016) (WP 7C) is a liaison statement, as responsible group for WRC‑23 1.14, to WPs 4A, 4C, 5A, 5B, 5C, asking information technical and operational characteristics of services, planned or operating, in the frequency range 231.5-252 GHz and in the adjacent bands, as appropriate. Answer is expected not later than by the first planned meeting of WP 7C in 2021.

**Smart Grid.**

*Highlights*: no action was deemed necessary

*Documents*:

Document [**5C/649**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0649) **(**WP 5A) is an answer liaison statement to WP 1A (WP 5C in copy) informing on progress preliminary draft revision of Report ITU-R [SM.2351-2](https://www.itu.int/pub/R-REP-SM.2351-2-2017) on smart grid utility management systems. The document was noted.

Document [**5C/660**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0660) **(**WP 1A) is a liaison statement to WPs 5A and 5D, ITU-T SG 15 and 3GPP thanking for comments received to progress WD towards a PDR of Report ITU-R SM.2351-2 on smart grid utility management systems, including some related amendments. The document was noted.

*Coordination area*

Recommendation ITU-R SM.1448

*Highlights*: no action was deemed necessary

Document [**5C/652**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0652) **(**WP 1A) is a liaison to thank several groups for answering WP 1A liaisons on System parameter tables in Recommendation ITU-R SM.1448 (information on its completion is given) and Appendix **7 (Rev.WRC-15)** of the Radio Regulations. The document was noted.

*Propagation*

*Highlights*: no input at this meeting

***RF noise – EMC***

*Highlights: no action was deemed necessary*

Input documents:

Document [5C/654](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0654) **(WP 1A)** is a reply liaison statement to CISPR on EMC standards
and limits. In particular, aspects related to interference to the EESS (passive) in the frequency band 1 400-1 427 MHz and Interference from LED lighting are addressed. The document was noted.

Document [5C/655](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0655) **(WP 1A)** is a liaison statement to CISPR expressing concerns that the traditional way of setting limits on radiated disturbances in product standards no longer provides adequate safeguards against interference and is contributing to rising levels of RF noise in the environment. The liaison requests CISPR to review the methodology for setting limits on radiated disturbances. The document was noted.

Activities related to ITU-T SG 5

*EMF and Human exposure – No action was deemed necessary at this meeting.*

*Input documents:*

Document [5C/653](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0653) **(ITU-T Q 3/5) c**ontains the results of the last meeting of Q 3/5, including the revision of workplan. Information on updating of Recommendation ITU‑T K.100 “Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service” is contained. The document was noted.

Document [5C/665](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP5C-C-0665) (ITU-T SG 5) addresses WP 1C and ITU-D Q7/2, providing the main outcomes of the last ITU-T Q3/5 meeting on Human exposure to electromagnetic fields (EMFs), answering some questions from WP 1C. ITU-T SG 5 looks forward to collaborate closely with ITU-R and ITU-D. The document was noted.

Document [5C/42](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0042) (ITU-T SG5), provided for information to WP 5C and other groups, contains the main outcomes of the last meeting of ITU-T Q3/5, to continue exchange of information with ITU-R and ITU-D on the subject of EMF. Document includes also several links where more information is accessible.

Note: See also “Activities related to ITU-D”.

Activities related to ITU-T SG 9

*Highlights:* No specific action was deemed necessary at this meeting.

*Input documents:* Document [5C/18](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0018) (ITU-T SG9) is a liaison to ITU-T SG15, providing updates on the position of ITU-T SG9 in relation with the ANT Standards Work Plan. Several groups are addressed for information. Document was introduced and commented.

Activities related to ITU-T SG 15

*Highlights*: No input at this meeting.

Intersector coordination

*Highlights*: No input at this meeting.

Activities related to ITU-D

*Highlights*: No action was deemed necessary at this meeting.

*Input document:* Document [5C/2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0002) **(ITU-D SG2)** contains answers and comments related to last meetings of ITU-T SG5 and ITU-R WP 1C in relation with strategies and policies concerning human exposure to EMF. Comments are expected to improve the Output Report of ITU-D SG2 Q7/2.

The document was noted.

WMO

*Highlights: No action was deemed necessary at this meeting.*

*Input documents:* Document [5C/17](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0017) (WMO) provides the position of WMO on behalf of the WRC‑23 AIs.

Considering that passive sensing requires the measurement of naturally occurring radiation, usually of very low power levels, where relevant frequency bands are determined by fixed physical properties (molecular resonance) that cannot hence be changed or ignored, and reminding the very high importance that meteorological observation is gaining in several sectors for a global vision, including climate and environmental aspects, document expresses concerns that the trend for a increased use of several band could negatively impact meteorological observations producing additional noise and interference. As such, document strengthens the importance to protect these frequency ranges. In relation with AIs, a note is given towards 9.1c, considering that it is very broad in scope and could hence potentially affect a large number of meteorological operations and applications, including EESS (passive) under RR No. **5.340**.

## 9.2 WG 5C-3 Output deliverables

*Deliverables agreed to be presented to SG 5 July 2020 meeting for approval*: none

Deliverables approved by WP 5C Plenary:

– Reply liaison statement to WP 7C, on agenda item 1.14, addressing equipment characteristics and protection criteria for FS (Document 5C/TEMP/18): to become Document [7C/47](https://www.itu.int/md/R19-WP7C-C-0047/en).

– Liaison to WP 7C to gather information useful to progress revision of Report [ITU-R F.2416-0](https://www.itu.int/pub/R-REP-F/publications.aspx?lang=en&parent=R-REP-F.2416) (275-450 GHz) (Document 5C/TEMP/14): to become Document [7C/43](https://www.itu.int/md/R19-WP7C-C-0043en).

– Liaison to WP 7C on Protection of EESS (passive) systems operating in bands above 92 GHz and up to 174.8 GHz informing about the updates of activities in this frequency range and asking confirmation if the same limits currently adopted in Resolution **750** for the protection of the EESS (passive) in the band 86-92 GHz can be used to cover (Document 5C/TEMP/19): to become Document [7C/31](https://www.itu.int/md/R19-WP7C-C-0031en).

Deliverables to be annexed to Chairman’s Report:

WD towards a PDR of Report ITU.R F.2416-0 (Document 5C/TEMP/12) to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N06%21MSW-E.docx) (Annex 6).

Elements towards revision of Recommendation ITU-T F.699 (Document 5C/TEMP/1) to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N02%21MSW-E.docx) (Annex 15).

*Deliverables to be retained in Chairman’s Report:*

Elements for consideration on future revisions of Recommendations ITU-R F.699, ITU-R F.1245 to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N02%21MSW-E.docx) (Annex 2).

# 10 Working Group 5C-4 – Wide range and no specific frequency range –

 Review and proposed revisions of Recommendations and Reports covered by WGs 1, 2 and 3, activities related to WRC-23 A.I. 9.1c, maintenance of FS deliverables, revision of Questions, Vocabulary.

Chairman: Dr Shinya Otsuki (Japan)

WG 5C-4 established no official Draft Groups at this meeting.

*Input documents*: 12 (+ 0 Annexes); output documents: 2 (Annexes)

*Meeting results:* Agreement was held on possibility to start a new for revisions of Recommendation ITU-R F.758-7 (FS characteristics for sharing), activity to develop a new revision of Recommendation ITU-R F. 1777 (TVOB, ENG) was agreed Recommendation ITU-R F.699

## 10.1 Input documents presentation and discussions

***Recommendation ITU-R F.758-7*** (system parameters for sharing FS /others)

Since this activity is under joint responsibility of WP 5A/5C, it was agreed between WP 5A and WP 5C Chairs that at this meeting, activities related to Recommendation ITU-R F.758-7 are led by WP 5C, since contributions received just refer to the FS.

*Highlights*: several documents, also considered in WG 2 in relation with possible reply liaisons related to WRC-23 agenda items, propose amendments to some parameters in some frequency bands, or contain sections providing equipment typical values, to be evaluated in a future revision of Recommendation ITU-R F.758-7.

The need for starting a possible revision met wide support, but there was no time to prepare a working document at this meeting. As a consequence, related was collected to be annexed to Chairman Report of this meeting, to be considered in future.

*Input documents:*

Document [5C/39](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0039) (Russia) provides a comparison of some equipment characteristics with the values specified in Recommendation ITU-R F.758-7 in the band 6 425-7 125 MHz. It was specified that main scope of the document is to propose use of these values for sharing studies.

Document [5C/46](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0046) (Huawei Sweden) provides a table showing typical values of today’s equipment in frequency band 6 425-7 125 MHz, proposes to include these values in next revision of Recommendation ITU-R F.758-7.

Document [5C/47](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0047) (Telephone AB – LM Ericsson) provides a set of values / ranges about some equipment parameters, in several frequency ranges from 6 to 27 GHz bands, and values for rural and urban areas, in frequency band 6 425-7 125 MHz. It is proposed to include the values in next revision of Recommendation ITU-R F.758-7.

Document [5C/53](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0053) (United Kingdom) proposes an updated set of parameters for insertion of in a revision of Recommendation ITU-R F.758-7, in relation with 12.75-13.25 GHz band.

Note: More information about these documents can be found in WG2 section related to WRC-23 agenda item 1.2.

Discussion: WG 5C-4 considered the proposal contained in input documents, agreeing that, considering that this recommendation is probably the most important within WP 5C deliverables, and that its content should reflect the evolution of technology, there is a need to consider starting activity for a new revision. During discussion, the relevance of having all the relevant information in one Recommendation was reminded, together with the need of addressing some features that are commonly implemented in today’ s equipment, such as the ATPC and adaptive modulation, which is currently not considered. The need of trying to restrict the range of values that are sometimes associated to parameters was also expressed, to facilitate related studies.

***Recommendation ITU-R F.1336-5***

*Highlights:* Under Chairmen agreement, this topic was discussed jointly with 5C-3; Opening of new activity was not considered necessary at this meeting.

*Input documents:* Document [5C/40](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0040) (ATDI) proposes a Working Document towards a Preliminary Draft New Revision (WD\_PDNR) of Recommendation [ITU-R F.1336](https://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1336)-5 ‘Reference radiation patterns of omnidirectional, sectoral and other antennas for the fixed and mobile service for use in sharing studies in the frequency range from 400 MHz to about 70 GHz’. Amendments for the 3 sectors cell and extension of upper frequency limit to 86 GHz is included in the proposal. Proposed WD is included.

After discussion, it was agreed that no applications of PMP systems covering frequencies above the current upper frequency limit are foreseen at the moment, so there is no immediate need of extending frequencies.

***Recommendation ITU-R F.699-2***

Under Chairmen agreement, this topic was discussed jointly with WG 5C-3; See WP 5C-3.

***Recommendation ITU-R F.1777-2***

*Highlights:* a new WD towards a revision was agreed, to be annex to Chairman’s Report.

*Input documents:* Document [5C/41](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0041) (Japan) proposes to start a revision of Recommendation ITU‑R F.1777-2 (System characteristic of television outside broadcast, electronic news gathering and electronic field production in the fixed service for use in sharing studies), in relation with Question ITU-R 252/5.

Revision is felt necessary to cover new systems, used in Japan for broadcast auxiliary services (BAS) for the transmission of UHDTV signals in the frequency bands 5.850-8.500 GHz, 10.250‑13.250 GHz and 41.0-42.0 GHz. A proposed WD is included.

***AAS***

*Input documents:* Document [5C/38](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0038) (France) proposes to send a liaison to WP5D, requesting to be kept informed about the development of activities related to RR No. **21.5** in case of use of AAS, since conducted measures are not possible for these devices, since also FS is addressed by this article.

Several administrations expressed the view that the topic at the moment is under responsibility to WP 5D and did not support sending the liaison statement at this meeting, some others expressed support. It was also noted that the progress of the item in WP 5D is not very advanced, and some delegates noted that was already raised at other meetings, so the topic can be discussed again, in next meetings, based on contributions, but there was no agreement to send the liaison statement from current meeting

WRC-23 AI 9.1 topic c

*Highlights:* discussion was held on a joint session with WP 5A; no action was deemed necessary at this meeting from WG 5C-4. More information is available in section 11 of this document.

***RSTT***

*Highlights:* No action was deemed necessary at this meeting

*Input documents:* Document [5C/54](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0054) (Germany) contains a proposal to draft new study Question ITU-R [RSTT] – Studies related to the further development of RSTT, to be assigned to WP 5A. The Question should address technologies, frequency bands, implementation and solutions, compatibility, in relation to RSTT. Document was presented and discussed.

***Vocabulary***

*Input documents:* Document [5C/48](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0048) (CCV Chairman) provides information high level information on terminology related activities, including related Recommendation and Resolution, introducing the database “ITU Terms and Definitions” and its structure, providing guidance on use and updating of terms, encouraging interaction with SGs to maintain the database updated.

## 10.2 WG 5C-4 Output deliverables

*Deliverables agreed to be presented to SG 5 September 2019 meeting for adoption: none*

*Deliverables approved by WP 5C Plenary: none.*

Deliverables annexed to Chairman’s Report:

– Compilation of inputs to be considered for a next revision of Rec. ITU-R F.758-7 (System parameters and considerations in the development of criteria for sharing or compatibility between digital fixed wireless systems in the fixed service and systems in other services and other sources of interference) (Document 5C/TEMP/2) – to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N11%21MSW-E.docx) (Annex 11).

– WD towards a PDR of Recommendation ITU-R F.1777-2 (System characteristic of television outside broadcast, electronic news gathering and electronic field production in the fixed service for use in sharing studies) (Document 5C/TEMP/3) to become Document [5C/59](https://www.itu.int/dms_pub/itu-r/md/19/wp5c/c/R19-WP5C-C-0059%21N14%21MSW-E.docx) (Annex 14).

*Deliverables retained in Chairman’s Report: None.*

# 11 Joint meeting WP 5A-5C

WRC-23 AI 9.1 topic c

*Highlights:* deep discussion arose on several points of general nature, including deeper insight of text of resolution, possible actions to be undertaken, possible way of proceeding. No liaisons have been produced by joint activity at this meeting.

*Input documents:*

Document [**5C/13**](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0013) (WP 5A-5C Chairs) provides general information on organization of the work on WRC-23 agenda item 9.1, topic c (Study the use of International Mobile Telecommunication systems for fixed wireless broadband in the frequency bands allocated to the fixed service on a primary basis, in accordance with Resolution **175 (WRC 19)**). Documents reminds that both WPs have been assigned responsibility for studies, (WP 5A is responsible for CPM text).

Document [5C/55](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0055) (Germany, Netherlands, France, Luxembourg, Spain, Hungary, Malta) proposes a joint liaison (WP 5A-5B) to provide clarification to the contributing WPs on the scope of the studies to be performed in WPs 5A and 5C under agenda item 9.1c; the proposed liaison also requests to receive characteristics and protection criteria of the service(s) with a co-primary allocation to the fixed service in the bands or a primary status in the adjacent bands, as appropriate.

Document [5C/56](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0056) (United Kingdom) proposes a joint liaison statement (WP 5A-5B) to provide clarification to the contributing WPs on the scope of the studies to be performed in WPs 5A and 5C under agenda item 9.1 topic c; the proposed liaison statement informs that any relevant information will be requested as necessary.

Document [5A/58](https://www.itu.int/md/R19-WP5A-C-0058/en) (China), not submitted to WP 5C, was discussed, proposing some possible activities to be undertaken, with related timeline. It will be carried forward to the next WP 5A meeting.

Discussion

Meaning of related terminology is provided, together with the indication of main deliverables which were developed in the past in relation with FWA. Attention of the group is reminded on the fact that most material is about 20 years old, and the technical characteristics of FWA expected today are significantly different than the original, especially for a very high increase of capacity, and due consideration is to be given to this aspects.

Deep discussion was held to common understanding of the meaning of the text in the AI 9.1 topic c. In particular, the meaning of “IMT systems” in this context was examined, to ensure that this activity is not to be intended related to the MS. The group agreed this term should be intended, in context of 9.1 topic c as an alternative to “IMT Technology”, and, as such, every activity undertaken in future would be totally inside the Fixed Service.

Under this agreement, it was recognized that the activity is within the usual activities of the WPs 5A and 5C, and consideration of development of a specific new recommendation, providing guidance in the use of IMT technology in FWB could be a possible result of the activity.

Different opinions were expressed by administrations on whether the possible regulatory related studies could be conducted or not in this topic, however, no consensus was reached in this meeting.

Several participants expressed agreement that proper study is needed to properly cover the task.

Regarding working methods, majority of administrations expressed opinions in favour of a specific joint group to carry on the overall activity (implying frequency slots to be assigned to it), while some other participants expressed preference to separate activities within each groups, according to the respective expertise, depending on topics under study.

WP 5A ad WP 5C Chairmen agree on the need to continue to coordinate the joint activity on AI 1.9 topic c at next meetings, taking account of the inputs.

*Resolution 59-ENG / PMSE*

*Highlights:* discussion was held on a joint session with WP 5A; no action was deemed necessary at this meeting from WG 5C-1.

*Highlights:* discussion was held on a joint session with WP 5A; no action was deemed necessary at this meeting from WP 5C.

*Input document:*

Document [5C/5](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0005)(WP 6A) provided information of revision of Resolution 59 by the WRC-19, and of starting of a new activity towards the development of a PDNRep ITU-R [ENG / PMSE\_RES59] – Frequency Bands for Audio Electronic News Gathering (ENG) and Programme Making and Special Events (PMSE) in accordance with Resolution ITU-R 59”, currently as WD.

An update is contained on recent activities in Working Party 6A related to ENG / PMSE.

Document was considered as informative for WP 5C and noted.

Document [5C/49](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0049) (Germany) proposes to inform Task Group TG 6/1 about the activities within Working Parties WP 5A-5C, which will provides relevant information on SAB/SAP, ENG, and PMSE usage. Possible revision of Resolution ITU-R 59-2 is proposed to be included in the information, as well as reference to the start of activity (in WP 5A) towards a draft new Report ITU-R M.[AUDIO PMSE Usage].

Document [5C/50](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0050) (Germany) proposes a common working activity between WP 5A-5C, to prepare an update of Resolution ITU-R 59-2for Radio Assembly 2023, noting a lack of alignment between ongoing ITU-R activities regarding the current SAP/SAB, ENG and PMSE use, bands and technologies, both present and future. Regional and worldwide visions should be focused.

Document [5C/51](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0051) (Germany) proposes to develop a new Report addressing the current and future usage of Audio PMSE equipment throughout the Regions, to complement the proposal regarding the update of Resolution ITU-R 59-2 for RA-23 focusing on the equipment used e.g. wireless microphones, talkback systems, wireless in-ear monitor systems and wireless video cameras. A proposal for a related Working Document is included.

Document will be carrier forward to next meeting.

*Discussion:* several members agreed that the items requires to be carefully considered, since there is possibility to contribute on ongoing studies. The need to provide support to populate the ENG/SNG was expressed and found also supporters. It was also discussed that the applications addressed by this Resolution could be under several other services, in addition to the FS and MS, and some of them could be considered belonging to SRD. There is therefore a need that other WPs are involved in the discussion, such as WPs 1B and 6A. Propagation aspects were also indicated among possible different aspects to be considered.

Comment was made that this is not the introduction of a new task, rather than a possible way forward to work on an existing tasks.

At the end, most participants expressed interest for this topic, agreeing that, considering the views express on the general discussion, consolidation of an agreement is expected during next meeting. Contributions are requested from Administrations.

Finally, the possibility to send liaison to TG 6/1 was not agreed from this meeting.

Due to lack of time, proposal to start development of a new Report on ENG was not discussed and related Document [5C/51](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP5C-C-0051)will be carried forward to next meeting.

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APPENDIX 1

ITU-R Questions assigned to Working Party 5C

| Question ITU‑R | Title | Category | WP  |
| --- | --- | --- | --- |
| [110-3/5](http://www.itu.int/pub/R-QUE-SG05.110) | Reference radiation patterns of point-to-point fixed wireless system antennas for use in sharing studies | S2 | 5C |
| [242-2/5](http://www.itu.int/pub/R-QUE-SG05.242) | Reference radiation patterns of omnidirectional and sectoral antennas for the fixed and mobile services for use in sharing studies | S2 | 5A, 5C, 5D |
| [246-1/5](http://www.itu.int/pub/R-QUE-SG05.246) | Technical characteristics and channelling requirements for adaptive HF systems | S2 | 5C |
| [247-1/5](http://www.itu.int/pub/R-QUE-SG05.247) | Radio-frequency arrangements for fixed wireless systems | S2 | 5C |
| [248/5](http://www.itu.int/pub/R-QUE-SG05.248) | Technical and operational characteristics for systems in the fixed service used for disaster mitigation and relief | S1 | 5C |
| [252/5](http://www.itu.int/pub/R-QUE-SG05.252) | Frequency sharing and compatibility between systems in the fixed service and systems in other services | S1 | 5C |
| [253/5](http://www.itu.int/pub/R-QUE-SG05.253) | Fixed service use and future trends | S2 | 5C |
| [257-1/5](http://www.itu.int/pub/R-QUE-SG05.257) | Technical and operational characteristics of stations in the fixed service in the frequency range 275-1 000 GHz | S2 | 5C |
| [258/5](http://www.itu.int/pub/R-QUE-SG05.258) | Technical and operational principles for HF sky-wave communication stations to improve the man-made noise HF environment | S2 | 5C |

APPENDIX 2

Chairman’s Report structure – Annexes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| May 19 | Jul 20 | Topic | Status (1) | Last contr | /TEMP/ |
| *648* | [59](https://www.itu.int/md/R19-WP5C-C-0059/en) | Chairman’s Report 5C/… |  |  |  |
| 1 | **1** | **Handbook on adaptive HF systems tutorial** | WD | Jul 2020 | 8 |
| 2 | **2** | **Elements for future revisions > 275 GHz** | EL (F) | May 2019  | 203 |
| 3 | **3** | **Rec. ITU-R F.[UNWANTED]** | EL (F) | Jul 2020 | 11 |
| 4 | **4** | **F.[HF ENV] – Rep.** | PD (C) | Jul 2020 | 9 |
| 5 | **5** | **Rep. ITU-R F.[CSA]** | PD (C) | Jul 2020 | 7 |
| 6 | **6** | **Rep. ITU-R F.2416-0 revision** | WD(N)o | Jul 2020 | 12 |
| 7 | **7** | **Rec. ITU-R F.383-9** | PD(C) | Jul 2020 | 25 |
| 8 | **8** | **Rec. ITU-R F.637-4 (21.2-23.6 GHz)** | PD(C) | Jul 2020 | 26 |
| 9 | **9** | **Rec. ITU-R F.1520-3 (31.8-33.4 GHz)** | WD (F) | Nov 2018 | 183 |
| 10 | **10** | **Rec. ITU-R F.2005-0 (40.5-43.5 GHz)** | WD (F) | Nov 2018 | 184 |
| 11 |  | Draft LS to WP 1A | nco | May 2019  | 201 |
|  | **11** | **Rec. ITU-R F.758-7** | EL (N) | Jul 2020 | 2 |
| 12 |  | List of output documents |  |  |  |
|  | **12** | **Rec. ITU-R F.749-3 Rev. (38 GHz)** | WD (N) | Jul 2020 | 23 |
|  | **13** | **Rec. ITU-R F.595-10 Rev. (18 GHz)** | WD (N) | Jul 2020 | 22 |
|  | **14** | **Rec. ITU-R F.1777-2** | WD (N) | Jul 2020 | 3 |
|  | **15** | **Rec. ITU-R F. 699** | EL (N) | Jul 2020 | 1 |
|  | **16** | List of output documents |  |  |  |

**Legend**:

N = New item

EL = Elements

WD = Working document

P = Published

PD = Preliminary draft

D SG5 = Draft sent to SG 5

nco = not carried on

Rec =recommendation

Rep = Report

(C) = Document status changed from last meeting

(F) = carried forward

**Bold:** currently in the annexes of Chairman’s Report