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| U.S. Radiocommunications SectorFact Sheet |
| **Working Party:** ITU-R WP 5C | **Document No:** USWP5C-07 |
| **Ref:** WP 5C Document 5C/69 | **Date:** 7 October 2020 |
| **Document Title:** WP 5C REPLY TO WP 5B LIAISON (5C/69) REQUESTING RELEVANT INFORMATION IN SUPPORT OF SHARING AND COMPATIBILITY STUDIES UNDER WRC-23 AGENDA ITEM 1.8 |
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| **Purpose/Objective:** The purpose of this contribution is to propose a reply to the liaison from WP 5B, which asked Working Parties responsible for services potentially affected by WRC-23 Agenda Item 1.8, to provide relevant information including technical and operational characteristics and protection criteria.  |
| **Abstract:** Under WRC-23 Agenda Item 1.8, WP 5B is required to perform sharing and compatibility studies for Unmanned Aircraft Systems Control and Non Payload Communications use of the Fixed Satellite Service. The draft reply from WP 5C, proposed in the contribution from the USA, provides system and antenna characteristics as well as appropriate protection criteria that can be used by Working Part 5B in its considerations under WRC-23 AI 1.8. |

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| **Radiocommunication Study Groups** |  |
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| Source: Document 5C/69Subject: WRC-23 Agenda item 1.8,Resolution **155 (Rev.WRC-19)** Resolution **171 (WRC-19)**  | **Document 5B/XX-E** |
| **November 2020** |
| **English only** |
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| **United Stated of America** |
| REPLY Liaison statement to Working Party 5B |
| **Technical and operational characteristics and protection of the Fixed Service****Introduction**Resolution **171 (WRC-19)** *resolves to invite the ITU Radiocommunication Sector*:1. to continue and complete in time for WRC-23 relevant studies of the technical, operational and regulatory aspects, based on the frequency bands mentioned in *resolves 1* of Resolution **155 (Rev.WRC-19),** in relation to the implementation of Resolution **155 (Rev.WRC-19)**, taking into account the progress obtained by ICAO in the completion of SARPs on the use of FSS for the UAS CNPC links.
2. to review No. **5.484B** and Resolution **155 (Rev.WRC-19)** taking into account the results of the above studies

To support the required sharing and compatibility studies to be carried out within Working Party 5B, Working Party 5B contacted Working Parties responsible for potentially affected services and requested them to provide relevant information, including technical and operational characteristics and protection criteria for the respective services allocated in, the frequency bands in *resolves 1* of Resolution **155 (Rev.WRC-19)**.Working Party 5C is one such responsible Working Party and received 5C/69 from Working Party 5B following its July 2020 meeting.**Proposal**The United States of America proposes to assist in answering the above liaison request with the attached contribution, which provides a draft reply from Working Party 5C that includes information regarding the fixed service for which Working Party 5C is the expert group.**Attachment:** 1**ATTACHMENT**REPLY Liaison statement to Working Party 5B**Technical and operational characteristics and protection of the Fixed Service** |

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1. **Introduction**

Working Party 5C thanks Working Party 5B for its liaison statement in Document 5C/69 in which it indicates that it has initiated development of material for WRC-23 Agenda Item 1.8 in accordance with the provisions of Resolution **171 (WRC-19)**.

Working Party 5C notes Working Party 5B’s request to provide relevant information, including technical and operational characteristics and protection criteria for the respective services allocated in, the frequency bands in *resolves 1* of Resolution **155 (Rev.WRC-19)[[1]](#footnote-1)** and hopes that the following information will help WP 5B in its sharing and compatibility studies under WRC-23 Agenda Item 1.8.

Working Party 5C provides the following replies based on its understanding that UAS CNPC Links shall comply with Resolution **155 (Rev.WRC-19)** in particular those resolves relating to the fixed service including *resolves 8, 10, 11, 14, 15 and 16* of that Resolution.

**2 Fixed Service Technical and Operational Characteristics**

Recommendation ITU-R F.758 was recently updated (November 2019) and, as before in its previous reply on the same topic, Working Party 5C can confirm that the system parameters in the frequency band 10.7‑11.7 GHz of Table 8 of Recommendation ITU-R F.758-7 should be used in the compatibility studies for the 10.95-12.75 GHz frequency band of interest to Working Party 5B and that the system parameters in the frequency band 14.4-15.35 GHz of Table 9 of Recommendation ITU-R F.758-7 should be used in compatibility studies for the 14‑14.47 GHz band of interest to Working Party 5B.

Additionally, again as before in its previous reply on the same topic, Working Party 5C confirms that the statistical antenna elevation and height information found in Recommendation ITU-R F.2086-0; tables A2-2 (10.7 11.7 GHz) and A2-3 (14.25-14.5 GHz) should be used by Working Part 5B in its studies under Agenda Item 1.8. Working Part 5C notes that this Recommendation is not currently being considered for revision. For the 14-14.47 GHz frequency band of interest, Working Party 5C recommends a maximum antenna elevation angles of 5 degrees associated to the maximum antenna gain.

Working Party 5C also advises Working Part 5B that the following recommendations are still the relevant source of antenna patterns for studies with the fixed service and that they all have been recently updated:

For point-to-point links:

* Recommendation ITU-R F.699-8: Reference radiation patterns for fixed wireless system antennas for use in coordination studies and interference assessment in the frequency range from 100 MHz to 86 GHz.
* Recommendation ITU-R F.1245-3: Mathematical model of average and related radiation patterns for line-of-sight point-to-point fixed wireless system antennas for use in certain coordination studies and interference assessment in the frequency range from 1 GHz to about 86 GHz.

WP 5C would like to bring to the attention of WP 5B that for the protection of the fixed service sharing studies, ITU-R F.1245 is more appropriate for aggregated interference and for cases when the interferer is moving.

For point-to-multi point links:

– Recommendation ITU-R F.1336-5: Reference radiation patterns of omnidirectional, sectoral and other antennas for the fixed and mobile services for use in sharing studies in the frequency range from 400 MHz to about 70 GHz.

**3 Protection of the Fixed Service**

Working Party 5C notes that Recommendation ITU-R F.758 provides guidance on the protection criteria that should be taken into account in any studies of sharing with the fixed service. The Recommendation identifies the following three effects of interference, short-term, long-term, and fractional degradation performance (FDP), which all need to be taken into account in the protection of the fixed service in sharing studies:

* short term;

An I/N of +19 dB not to be exceeded for more than 2.7 x 10-4 % of the time as described in Recommendation ITU-R F.758-7 (Annex 1 Section 4.2) and Recommendation ITU-R F.1494 (Annex 1).

* long term:

An I/N of -10 dB not to be exceeded for more than 20% of the time as described in Recommendation ITU-R F.758-7 (Annex 2 Table 5).

* fractional degradation performance (FDP);

The Fractional Degradation in Performance (FDP) is not to exceed 10%. Working Party 5C would like to inform Working Party 5B that Recommendation ITU-R F.1108 introduced the Fractional Degradation in Performance (FDP) method.

Working Party 5C would also like to bring to the attention of Working Party 5B that the fixed service is allocated on a primary basis in the:

* 14.0-14.3 GHz frequency band, in the countries listed in **No. 5.505**;
* 14.25-14.3 GHz frequency band in the countries listed in **No. 5.508**;
* 14.3-14.4 GHz frequency band in Regions 1 and 3;
* 14.4-14.47 GHz frequency band in the all three ITU-R Regions;

And that the fixed service is allocated on a secondary basis in the 29.5-30 GHz frequency band, in the countries listed in **No. 5.542**.

**4 Summary**

Working Part 5C invites Working Party 5B to take into account the information given in this reply to their liaison during its consideration of ensuring the protection of systems operating in the fixed service.

In particular, the power flux-density, produced on the territory of the countries which have an allocation in the fixed service by any earth station aboard an unmanned aircraft operating under the fixed satellite service, shall not exceed the limits to be developed by Working Party 5B in cooperation with Working Party 5C.

WP 5C looks forward to continued collaboration with WP 5B.

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| **Status:** For information |
| **Contact:**  | **E-mail:**  |

1. *10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.5 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Regions 1 and 3 and 19.7-20.2 GHz (space-to-Earth), and in the frequency bands 14-14.47 GHz (Earth-to-space) and 29.5-30.0 GHz (Earth-to-space).* [↑](#footnote-ref-1)