

**Before the
Federal Communications Commission
Washington, D.C. 20554**

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| In the Matter of |) | |
| |) | |
| Recommendations Approved by World |) | IB Docket No. 16-185 |
| Radiocommunication Conference Advisory |) | |
| Committee |) | |

**COMMENTS OF ONEWEB ON DRAFT RECOMMENDATION
FOR WRC AGENDA ITEM 1.14**

WorldVu Development Limited (dba “OneWeb”) submits these comments in response to the Public Notice issued by the International Bureau on October 3, 2018, in the above captioned proceeding (the “PN”).¹ The PN seeks comments on the World Radio Communications Conference Advisory Committee’s (“WAC”) draft recommendations in Attachment A to the PN and NTIA’s draft proposals in Attachment B to the PN. These issues will be considered at the 2019 World Radiocommunication Conference (“WRC-19”).

Introduction

Agenda Item 1.14 is “to consider, on the basis of ITU-R studies in accordance with Resolution 160 (WRC-15), appropriate regulatory actions for high-altitude platform stations (HAPS), within existing fixed-service allocations.” The WAC Industry Working Group covering this agenda item did not reach a consensus but instead put forth four views.² OneWeb limits its comments to View D,³ specifically addressing the frequency bands: 47.2–47.5 GHz and 47.9-48.2 GHz; 27.9-

¹ See *International Bureau Seeks Comment on Recommendations Approved by World Radio Communication Conference Advisory Committee*, Public Notice, IB Docket No. 16-185, DA 18-1017 (October 3, 2018) (“PN”).

² See *id.*, Attachment A at p. 20 (presenting the four views in Document WAC/065).

³ See *id.*, Attachment A at p.p. 85-111 (View D).

28.2 GHz (HAPS-to-ground) and 31.0-31.3 GHz (ground-to-HAPS); and 6440–6520 MHz (HAPS-to-ground) and 6560-6640 MHz (ground-to-HAPS).

Discussion

OneWeb endorses in principle the proposals in View D, and the Commission should move forward with View D noting that the following proposed revisions and comments be addressed following the December 2018 CITELE meeting:

First, *considering* f) should be replaced with a reference to Recommendation ITU-R P.676 for propagation losses on the Earth-to-space slant path. The Recommendation ITU-R SF.1395 is a very old recommendation and gives global minimum losses between HAPS and fixed-satellite service (“FSS”) systems. Since the scope of a HAPS platform is local, the use of a global model is inappropriate. Hence, *considering* f) should instead read:

f) that Recommendation ITU-R P.676, “Attenuation by Atmospheric Gases”, should be used to determine the gaseous attenuation;

Second, *considerings* f) and g) are unclear as to what path between stations the referenced Recommendations actually apply to. To remove this ambiguity, the following text should be added to the current text of *considerings* f) and g):

on the interfering path between stations on or near the surface of the Earth and HAPS platforms or between HAPS ground terminals and space stations in the fixed-satellite service

Third, in *resolves* 1 of Draft Resolution [C114], there is a pfd mask (stated under clear sky conditions) for protecting the fixed service systems in neighboring administrations in the frequency ranges 24.25-24.75 GHz and 25.25-27 GHz. To verify compliance with the pfd mask, the following equation shall be used:

$$\text{pfd(El)} = \text{EIRP(El)} - 10 \cdot \lceil \log \rceil - 10 (4\pi d^2) - \text{rain fade}$$

Although this limit has no impact on the frequency bands in which OneWeb will operate, OneWeb finds that using a mask for regulatory compliance that includes rain fade loss is inconsistent with the Radio Regulations. Indeed, the Radio Regulations always specify power flux densities under clear-sky conditions, and the inclusion of rain fade in any related parameters is typically limited to wanted path parameters.

Fourth, as for the percentages of time in *resolves* 8 related to the protection of SRS/EESS Earth stations—in the case of the HAPS ground station towards an SRS/EESS Earth station path case—stating a percentage of time associated with pfd threshold values is not sufficient. Accordingly, *resolves* 8 should be restated as:

the pfd thresholds are not to be exceeded for the noted percentages of time.

In the current wording of *resolves* 8 of Draft Resolution [C114], the pfd threshold values are “. . . to ensure the protection of SRS/EESS satellite services from the HAPS platform or from the HAPS ground station.” To make *resolves* 8 clearer, it should be split into the following two *resolves*:

- In the first *resolves*, for the path case of HAPS platforms to earth stations, the pfd thresholds in *resolves* 8 would be restated after which it would indicate: “the pfd thresholds shall be met under clear sky conditions 100% of the time for the case of HAPS platforms into earth stations.”
- In the second *resolves*, for the path case of the HAPS ground station towards an SRS/EESS Earth station, the pfd thresholds in *resolves* 8 would be restated after which it would indicate attenuation using the relevant ITU-R propagation Recommendations shall be applied using the following percentages: 1) SRS: .001%; 2) EESS NGSO: .005%; 3) EESS GSO: 20%, and the HAPS and SRS/EESS antenna heights shall be used in this calculation.”

Fifth, in *resolves* 9, the text—“. . . considering a percentage of time of 2% in the relevant propagation model”—does not establish any meaning with the “2%” value associated with the pfd level. It should be modified to read:

. . . such that the pfd levels, when applying the appropriate propagation models, are not exceeded for more than 2% of the time.

Sixth, like *resolves* 9, there is no meaning associated with the “2%” value in *resolves* 10. Where the text states: “These pfd values shall be verified considering a percentage of time of 2% in the relevant propagation model” it should instead read:

It shall be verified using the relevant propagation model such that the respective (e.g., continuum or spectral line observation) pfd values are not exceeded for more than 2% of the time.

Under the equation, after $\text{Att}_{618p=2\%}$ the text reads: “. . . is the attenuation in dB from recommendation 618 corresponding to $p=2\%$ of the time at the radio astronomy location;” However, it should be revised to:

is the attenuation in dB from recommendation Rec. ITU-R Recommendation P.618 for which the attenuation on the HAPS platform to RAS station is exceeded for no more than 2% of the time;

Seventh, Under 4. PROPOSALS FOR THE 28 / 31 GHZ BANDS, there is a typo on the frequency range. The frequency range is stated as “27.9-28.32 GHz band.” It should instead read:

27.9-28.2 GHz band.

Conclusion

OneWeb supports in principle (with the noted modifications) View D to Agenda Item 1.14 and agrees with going forward with View D as a USA position for the December 2018 CITEL meeting. Furthermore, OneWeb notes that after the December meeting, these proposed seven revisions/comments above should be addressed in future revisions of the USA position.

Respectfully submitted,

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