MOD

RESOLUTION 663 (REV.WRC-23)

Studies on possible new additional allocations to the radiolocation service on a primary basis in the frequency range 231.5-275 GHz, and possible new identifications for radiolocation service applications in frequency bands within the frequency range 275-700 GHz

The World Radiocommunication Conference (Dubai, 2023),

considering

a) that all millimetric and sub-millimetric wave systems and applications in the radiolocation service (RLS) to be considered by this Resolution fall under the categories of ranging, imaging (including material analysis) and localization;

b) that those systems and applications are typically designed in two main configurations: active (radars) and receive-only (radiometers);

c) that those RLS systems and applications:

– have been recognized by scientific communities and governmental organizations as well suited for stand-off detection of concealed objects in the imaging category;

– will make a significant contribution to public safety, such as counterterrorism and the security of high-risk/high-value assets or areas in the imaging and localization categories;

– will significantly contribute to improving transportation safety in the near ranges around vehicles and in the Intelligent Transport Systems (ITS) context in general in the ranging, localization and imaging categories;

d) that the RLS systems and applications are divided into:

– active use, which may require a frequency bandwidth up to 30 GHz to achieve range resolutions in the order of half a centimetre;

– receive-only use, which will detect the extremely weak power that is naturally radiated by objects and require a much wider frequency bandwidth than active systems to collect enough power for detection;

e) that globally harmonized spectrum for those millimetric and sub-millimetric wave RLS systems and applications is highly desirable for achieving economies of scale;

f) that the optimal frequency range for the operation of those active millimetric and sub-millimetric wave RLS systems is 231.5-320 GHz, where the atmospheric absorption is relatively low;

g) that there are some narrower existing allocations to the RLS in the frequency range 217-275 GHz in the three ITU Regions, which however may not support the bandwidth required for these millimetric and sub-millimetric wave RLS systems and applications;

h) that those RLS systems and applications in:

– the imaging category will operate at low transmit powers, in ranges up to 300 metres, and are limited in space and in time;

– the ranging category are expected to be ubiquitously deployed specifically in the near ranges around vehicles, while the category localization is used in general in the ITS context;

– all categories may be severely affected by other power sources operating in the same frequency band;

i) that the technical and operational characteristics for those receive-only and active millimetric and sub-millimetric wave systems and applications in the different categories need to be described, including protection criteria in particular for receive-only systems and applications;

j) that the combination of chosen transmitting power and bandwidth for some of the applications listed in *considering c)* within the regulatory framework depends on the operational requirements in the frequency band(s) used,

noting

a) that No. **5.563A** applies in the frequency bands 235-238 GHz, 250-252 GHz and 265-275 GHz, identifying these frequency bands for use by ground-based passive atmospheric sensing;

b) that No. **5.340** applies in the frequency band 250-252 GHz, prohibiting all emissions in this frequency band;

c) that consideration of receive-only imaging systems and the naturally compatible Earth exploration-satellite service (EESS) (passive) and radio astronomy service (RAS) might be possible when making common assignments in order to improve the overall spectrum usage efficiency;

d) that No. **5.565** states that the use of the frequency range 275-1 000 GHz by the passive services does not preclude use of this frequency range by active services;

e) that No. **5.564A** identifies the frequency range 275-450 GHz for the use by administrations for the implementation of land mobile and fixed service applications with certain limitations to protect the EESS (passive) in the frequency bands 296-306 GHz, 313-318 GHz and 333-356 GHz and to protect the RAS in general, in accordance with Resolution **731 (Rev.WRC-23)**,

recognizing

a) that the frequency ranges 231.5-275 GHz and 275-700 GHz are also allocated to other radiocommunication services and that those allocations are used by a variety of incumbent systems in many administrations, and that the protection of these services, including adjacent services, should be studied;

b) that, for the determination of the incumbent services, the relevant provisions of the Radio Regulations in force apply;

c) that administrations wishing to make frequencies available in the frequency range 275-1 000 GHz for active service applications are urged to take all practicable steps to protect the passive services from harmful interference until the date when the Table of Frequency Allocations is established for the relevant frequencies,

resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference

1 the description of the technical and operational characteristics, including required protection criteria, for those receive-only and active millimetric and sub-millimetric wave RLS systems and applications in the categories listed in *recognizing a)*;

2 studies on globally harmonized spectrum for the RLS, in particular for those millimetric and sub-millimetric wave RLS systems and applications above 231.5 GHz;

3 sharing and compatibility studies (in-band and adjacent bands) for active millimetric and sub-millimetric wave RLS systems and applications with other services in the frequency range 231.5-275 GHz, while ensuring protection for the current use and further development of the incumbent services allocated to this frequency range;

4 sharing and compatibility studies (in-band and adjacent bands) for RLS applications with EESS (passive), space research service (passive) and RAS applications in the frequency range 275-700 GHz, while maintaining protection for the passive service applications identified in No. **5.565**;

5 sharing and compatibility studies (in-band and adjacent bands) for RLS applications with fixed service and land mobile service applications in the frequency range 275-450 GHz, as identified in No. **5.564A**,

invites the 2027 world radiocommunication conference

1 to determine, based on the results of the ITU-R studies described in *resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference,* possible new allocations to the RLS in the frequency range 231.5-275 GHz on a primary basis, considering required regulatory measures, while taking into account and ensuring the protection of the current use and further development of existing services in the frequency bands considered and in adjacent frequency bands;

2 to determine, based on the results of the ITU-R studies described in *resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference*, possible identifications of frequency bands in the frequency range 275-700 GHz for use by RLS applications, considering required regulatory measures, while ensuring the protection of the applications identified in Nos. **5.564A** and **5.565** in the frequency bands considered and, as appropriate, in adjacent frequency bands.