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RESOLUTION 663 (WRC-19)

**New allocations for the radiolocation service in the frequency band
231.5-275 GHz, and a new identification for radiolocation service
applications in frequency bands in the frequency range 275-700 GHz**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

considering

- a) that millimetre and sub-millimetre wave frequencies have been recognized by scientific communities and governmental organizations as well suited for stand-off detection of concealed objects;
- b) that millimetre and sub-millimetre wave imaging systems will provide a significant contribution to public safety, counterterrorism and the security of high-risk/high-value assets or areas;
- c) that millimetre and sub-millimetre wave imaging systems are typically designed in two main configurations: active (radars) and receive-only (radiometers);
- d) that active millimetre and sub-millimetre wave imaging systems require a frequency bandwidth wider than 30 GHz to achieve range resolutions in the order of one centimetre;
- e) that receive-only millimetre and sub-millimetre wave imaging systems 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;
- f) that globally harmonized spectrum for the millimetre and sub-millimetre wave imaging systems is required;
- g) that the optimal frequency range for the operation of the active millimetre and sub-millimetre wave imaging systems is between 231.5 GHz and 320 GHz, where the atmospheric absorption is relatively low;
- h) that there are some narrower existing allocations to the radiolocation service (RLS) in the frequency range 217-275 GHz in the three ITU Regions, which however do not support the bandwidth required for these systems;
- i) that, for the receive-only millimetre and sub-millimetre wave imagers, an identification in the frequency range 275-700 GHz is envisaged;
- j) that the frequency bands 235-238 GHz and 250-252 GHz are allocated to the Earth exploration-satellite service (EESS) (passive) on a primary basis;
- k) that the frequency bands 241-248 GHz and 250-275 GHz are allocated to the radio astronomy service (RAS) on a primary basis;

l) that a number of frequency bands in the frequency range 275-1 000 GHz are identified for use by passive services, such as the RAS, the EESS (passive) and the space research service (SRS) (passive);

m) 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;

n) 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,

noting

a) that active millimetre and sub-millimetre wave imaging systems operate at very low transmit powers (a few milliwatts typically) and short ranges (up to 300 metres);

b) that millimetre and sub-millimetre wave imaging systems may be severely affected by other power sources operating in the same frequency band;

c) that the technical and operational characteristics for millimetre and sub-millimetre wave imaging systems need to be defined, including protection criteria in particular for receive-only systems,

resolves to invite the ITU Radiocommunication Sector

1 to study the future requirements for globally harmonized spectrum for the RLS, in particular for millimetre and sub-millimetre wave imaging applications above 231.5 GHz, as referred to in *considering a) and b)*;

2 to define technical and operational characteristics, including required protection criteria, for millimetre and sub-millimetre wave imaging systems;

3 to study sharing and compatibility of active millimetre and sub-millimetre wave imaging applications with other systems in the frequency range between 231.5 GHz and 275 GHz, while ensuring that the EESS (passive), SRS (passive) and RAS allocated in this frequency range are protected;

4 to conduct sharing and compatibility studies between RLS applications and EESS (passive), SRS (passive) and RAS applications operating in the frequency range 275-700 GHz, while maintaining protection of the passive service applications identified in No. **5.565**;

5 to study sharing and compatibility of receive-only millimetre and sub-millimetre wave imaging applications with other systems in the frequency range between 275 GHz and 700 GHz;

6 to study possible new allocations to the RLS on a co-primary basis in the frequency range between 231.5 GHz and 275 GHz, while ensuring the protection of existing services in the frequency bands considered and, as appropriate, adjacent frequency bands;

7 to study a possible identification of frequency bands in the frequency range 275-700 GHz for use by RLS applications;

8 to review studies under *resolves to invite the ITU Radiocommunication Sector 1 to 7*, and elaborate regulatory measures for the possible introduction of millimetre and sub-millimetre wave imaging systems;

9 to complete the studies in time for WRC-27,
invites the 2027 World Radiocommunication Conference

to review the results of these studies and take appropriate actions,
invites administrations

to participate actively in the studies by submitting contributions to the ITU Radiocommunication Sector.