RESOLUTION 159 (WRC-15)

Studies of technical, operational issues and regulatory provisions for non-geostationary fixed-satellite services satellite systems in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space)

The World Radiocommunication Conference (Geneva, 2015),

considering

a) the need to encourage the development and implementation of new technologies in the fixed-satellite service (FSS) at frequencies above 30 GHz;

b) that FSS systems based on the use of new technologies above 30 GHz and associated with both geostationary (GSO) and non-geostationary (non-GSO) satellite constellations are capable of providing high-capacity and low-cost means of communication even to the most isolated regions of the world;

c) that the Radio Regulations should enable the introduction of new applications of radiocommunication technology to ensure the operation of as many systems as possible in order to ensure efficient use of the spectrum;

d) that, in accordance with No. **22.2**, non-GSO systems shall not cause unacceptable interference to GSO FSS and broadcasting-satellite service (BSS) networks and, unless otherwise specified in the Radio Regulations, shall not claim protection from GSO FSS and BSS satellite networks;

e) that non-GSO FSS systems would benefit from the certainty that would result from the specification of measures required to protect GSO FSS and BSS satellite networks under No. **22.2**;

f) that in the FSS, there are GSO satellite networks and non-GSO satellite systems operating and/or planned for near-term operation in the frequency band allocated to the FSS in the range 37.5-51.4 GHz;

g) that technical studies are required in order to ascertain the feasibility of, and conditions for, non-GSO FSS satellite systems sharing the frequency bands 37.5-42.5 GHz (space-to-Earth) and 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space): 1) with GSO satellite networks (FSS, MSS and BSS, as appropriate to the band), and 2) with other non-GSO FSS satellite systems;

h) that review of Resolution **750 (Rev.WRC-15)** may be required to take into account new development of non-GSO satellites,

considering further

that Recommendations ITU-R S.1323, ITU-R S.1325, ITU-R S.1328, ITU-R S.1529 and ITU-R S.1557 provide information on system characteristics, operational requirements and protection criteria that may be used in sharing studies,

noting

a) that filing information for GSO FSS satellite networks in the frequency bands 37.5-42.5 GHz (space-to-Earth), 49.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) has been communicated to the Radiocommunication Bureau;

b) that some of these GSO satellite networks are in operation and others will be operated in the near future;

c) that the frequency band 37.5-38 GHz is allocated to the space research service (deep space) in the space-to-Earth direction and the frequency band 40.0-40.5 GHz is allocated to the space research service and the Earth exploration-satellite service in the Earth-to-space direction on a primary basis;

d) that the frequency band 37.5-40.5 GHz is allocated to the Earth exploration-satellite service in the space-to-Earth direction on a secondary basis,

recognizing

a) that WRC-2000 adopted provisions, including epfd limits in Nos. **22.5C**, **22.5D** and **22.5F** to quantify No. **22.2**, in order to protect GSO FSS and BSS satellite networks from non-GSO FSS satellite systems in the 10-30 GHz frequency range;

b) that Resolution **76 (Rev.WRC-15)** contains aggregate power levels not to be exceeded by non-GSO FSS systems in order to protect against interference GSO FSS and GSO BSS networks in the 10-30 GHz frequency range;

c) that No. **5.552** urges administrations to take all practicable steps to reserve the frequency band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service operating in the frequency band 40.5-42.5 GHz;

d) that No. **5.554A** limits the use of the frequency bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) to geostationary satellites;

e) that No. **21.16** contains power flux-density limits applicable to non-GSO satellite systems to protect fixed and mobile services with allocations in the frequency band 37.5-42.5 GHz;

f) that the frequency band 50.2-50.4 GHz is allocated on a primary basis to the EESS (passive) and space research (passive) services, which must be adequately protected;

g) that WRC-03, having considered the outcome of preliminary ITU-R studies, decided that further studies would be needed to determine the conditions for non-GSO FSS satellite systems to share the 37.5-50.2 GHz frequency range with GSO FSS satellite networks;

h) that No. **5.556** indicates that radio astronomy observations are carried out in the frequency band 51.4-54.25 GHz and that mitigation measures may have to be defined in this regard;

i) that any potential revisions to limitations for the protection of passive services or radio astronomy observations will necessarily be forward-looking, and will be impractical to apply to FSS networks and systems described in *considering f)* and *noting a)* and *b)*,

resolves to invite ITU-R

to conduct, and complete in time for WRC-19:

1 studies of technical and operational issues and regulatory provisions for the operation of non-GSO FSS satellite systems in the frequency bands 37.5-42.5 GHz (space-to-Earth) and 47.2-48.9 GHz (limited to feeder links only), 48.9-50.2 GHz and 50.4-51.4 GHz (all Earth-to-space), while ensuring protection of GSO satellite networks in the FSS, MSS and BSS, without limiting or unduly constraining the future development of GSO networks across those bands, and without modifying the provisions of Article **21**;

2 studies carried out under *resolves to invite ITU-R* 1 shall focus exclusively on the development of equivalent power flux-density limits produced at any point in the GSO by emissions from all the earth stations of a non-GSO system in the fixed-satellite service or into any geostationary FSS earth station, as appropriate;

3 studies and development of sharing conditions between non-GSO FSS systems operating in the frequency bands listed in *resolves to invite ITU-R* 1 above;

4 studies of possible necessary revisions to Resolution **750 (Rev.WRC-15)** to ensure protection of the EESS (passive) in the frequency bands 36-37 GHz and 50.2-50.4 GHz from non-GSO FSS transmission, taking into account *recognizing i)* above, including study of aggregate FSS interference effects from networks and systems operating or planned to operate in the frequency bands described in *resolves to invite ITU-R* 1 above;

5 studies towards ensuring protection of the radio astronomy frequency bands 42.5-43.5 GHz, 48.94-49.04 GHz and 51.4-54.25 GHz from non-GSO FSS transmissions, taking into account *recognizing i)* above, including study of aggregate FSS interference effects from networks and systems operating or planned to operate in the frequency bands described in *resolves to invite ITU-R* 1 above,

further resolves

to invite WRC-19 to consider the results of the above studies and take appropriate action,

invites administrations

to participate in the studies by submitting contributions to ITU-R.