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RADIO SPECTRUM POLICY GROUP

Opinion

on

the EU-level policy approach to satellite Direct-to-Device connectivity and related Single Market issues

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1. Introduction

The Radio Spectrum Policy Group (RSPG) gathers high-level governmental experts of EU Member States. The RSPG provides the European Commission, Parliament and the Council with strategic advice on high-level policy matters in relation to spectrum. The RSPG is also a forum for a fruitful exchange on effective and efficient management and use of radio spectrum.

Since 2003 the RSPG has provided timely and relevant advice on strategic policy issues to policymakers supporting implementation of EU policy in order to reap the full potential of spectrum for the sustainable development of Europe's economy and society. The RSPG is standing on a solid base of cooperation between the national experts on spectrum policy, management, harmonisation and licensing. The RSPG triggers spectrum harmonisation initiatives and develops spectrum policy further to interactions with relevant stakeholders (through workshops, public consultation, etc.).

This Opinion is the RSPG response to the request from the European Commission for an Opinion on the EU-level policy approach to satellite Direct-to-Device connectivity and related Single Market issues[1].

The RSPG has engaged on satellite issues recently in the addendum on Satellite Authorisations to the Opinion on "The future of the electronic communications sector and its infrastructure"[2]. In this addendum the successful management of authorisations for frequency usage – including by satellite services – at national level is emphasised.

The RSPG has also recently issued the Opinion on assessment of different possible scenarios for the use of the frequency bands 1980-2010 MHz and 2170-2200 MHz by the Mobile Satellite Services beyond 2027 (RSPG Opinion on the 2 GHz MSS)[3].

The conclusions presented in these Opinions are still valid. In developing this Opinion, the MSS 2 GHz case has not been further addressed.

To pave the way for future investment and initiatives, the International Telecommunication Union (ITU) World Radiocommunications Conference in 2027 (WRC-27) will address a number of satellite items. Agenda items 1.12 (Low Data Rate MSS), 1.13 (D2D in IMT-bands) and 1.14 (additional MSS allocation) at WRC-27 address international issues related to Direct-to-Device (D2D) or Internet-of-Things (IoT) satellites services. The RSPG will develop an Opinion and recommend an EU position for WRC-27 in due time prior to the conference. This work is outside the scope of this Opinion, which addresses European technical harmonisation, national authorisation and relevant European issues on satellite D2D connectivity.

The satellite market is currently subject to numerous initiatives, innovations and large investments from new satellite stakeholders, including those with large constellations. Both EU initiatives and third countries' initiatives have been considered when developing this Opinion. Based on these developments new challenges and issues are arising that have not previously been addressed including strategic spectrum issues. Within EU, contrary to other parts of the world, there are no "landing rights" for satellites (i.e. space segment authorisations) to offer services on the EU market.

[1] RSPG24-023
[2] RSPG23-044
[3] RSPG24-007

The RSPG has developed this Opinion on the basis of the responses from Member States to an internal questionnaire addressing both "Authorisation of D2D services in EU Member States" and "Access to EU market". Replies raised multiple issues, some beyond the scope of this Opinion. The strategic spectrum issues that have been included in this Opinion are those that trigger relevant recommendations from the RSPG. Issues beyond this Opinion could be considered as appropriate by the EU Member States, the European Commission, BEREC or CEPT according to relevant areas of expertise.

The draft Opinion has been subject to a public consultation in order to increase transparency and allow participation of all stakeholders. The public consultation on the draft version of this Opinion was held from 14 February to 28 March 2025. In all 34 responses were received, whereof five were submitted as confidential. The RSPG appreciates all the valuable contributions and comments which were considered when finalising this Opinion. For more information on the public consultation responses see the RSPG website, https://radio-spectrum-policy-group.ec.europa.eu/consultations-0_en.

2. Satellite Direct-to-Device connectivity

2.1. Definitions

The RSPG has identified various developments under the Satellite Direct-to-Device (D2D) umbrella, including the relevant WRC-27 agenda items, which are outside the scope of this Opinion, and agreed to further investigate the specificities of four distinct types of services. The main purpose of this subdivision of services is to pinpoint potentially different issues and initiatives based on the underlying spectrum access framework.

- D2D-IMT: Services direct to device in bands mostly used for the provision of terrestrial IMT-based services that have been harmonised within the EU for electronic communications services (ECS)[4]
- D2D-MES: Services direct to mobile earth stations (MES) in frequency bands specific to a satellite operator[5]
- D2D-IoT SRD: Services direct to IoT devices in frequency bands different from ECS harmonised bands and not specific to a satellite operator in short-range device (SRD) bands
- D2D-IoT MSS: Services direct to IoT devices in frequency bands different from ECS harmonised bands and not specific to a satellite operator in Mobile Satellite Service (MSS) bands < 1GHz.

Service provisions in Fixed Satellite Service (FSS) bands including Earth Stations in Motion (ESIM) are not covered by these above definitions, nor this Opinion.

[4] 700, 800, 900 MHz, 1400 MHz, 1800 MHz, 2 GHz, 2.6 GHz, 3.4-3.8 GHz, 26 GHz and 42 GHz

[5] This includes the 2 GHz MSS frequency band which has been subject to RSPG Opinion RSPG 24-007. Specific issues relating to the 2GHz MSS band will not be considered in this current workstream.

2.2. D2D-IMT services

Regarding D2D-IMT no application for providing commercial services has been requested in EU Member States yet. Early tests and trials are requested and handled under test and trial schemes on national basis. The RSPG notes that the harmonised ECS bands are licenced throughout the EU and are heavily used for the provision of terrestrial electronic communication services (See ECO report 03).

Given the current EU and CEPT harmonisation, national licensing in most Member States only covers mobile terrestrial use. The technical harmonisation decisions in relevant ECS bands all support development and innovation of mobile terrestrial use, so are the underlying CEPT deliverables. Thus, the introduction of D2D-IMT is currently generally not possible in ECS licences in EU Member States.

Given that terminals in harmonised bands are licence exempt and under the Radio Equipment Directive[6] (RED), no terminal related issues have been identified.

The perceived European benefits of D2D-IMT relate to complementary coverage - rural, remote and sea areas or when mobile ECS networks are temporarily unavailable due to external damage (e.g. flooding or earthquakes) or in case of temporary failure of mobile networks. Moreover, depending on location and type of service, D2D-IMT is not equivalent to mobile ECS networks.

There are a number of challenges such as complexity, cross border issues, roaming, interference and competition issues.

D2D-IMT could be introduced at national level in various ways:

- As an integral part of the terrestrial ECS licence
- As a licence for D2D provision requiring cooperation with the terrestrial ECS licence holder
- As a licence for D2D provision in geographical areas and available frequency bands not used by a terrestrial ECS licence holder (i.e. not requiring cooperation with a terrestrial ECS licence holder).

In practice, the two last options appear more complex to implement due to current authorisations and the coverage of ECS networks.

The currently known D2D-IMT satellite constellations are operating under ITU-R Radio Regulations (RR) No 4.4. The usage is under conditions of non-interference and of non-protection basis (assuming “no harmful interference” to other spectrum use in conformity with national and international regulations). At this stage, there is no definition and no quantification of an acceptable interference level into the other spectrum users (mobile ECS networks and other services). The WRC-27 will under agenda item 1.13 address protection of ECS networks and other services from D2D satellites operation and intends to provide a new RR framework for satellite operations in the concerned bands.

Issues identified in developing this Opinion include:

- Spectrum: technical studies to address sharing and compatibility with mobile ECS networks, cross borders interference issues, protection of other radio services, handling of ITU-R RR No. 4.4, role of CEPT mandates to support technical

[6] 2014/53/EU

harmonisation, timing of EU harmonisation in relation with WRC-27, amending ECS harmonisation decisions

- D2D IMT service provision:
    - Risk of unintentional roaming (when not addressed by harmonised technical conditions) resulting in unexpected costs to consumers
    - Emergency calling and numbering issues
    - Competition issues between providers (terrestrial and satellite).
- Authorisations: amendment of existing ECS authorisations to include provision of satellite D2D IMT services (see relevant provision in the European Electronic Communications Code (EECC)[7], in particular relevant coverage obligations may have to be revised)
- Security: lawful intercept, sovereignty, national security, privacy.

The RSPG has considered the relevant strategic spectrum issues and developed recommendations as appropriate in section 4. In addition, the RSPG will address relevant WRC-27 issues when developing its Opinion on WRC-27.

Issues beyond this Opinion could be considered as appropriate by the EU Member States, the European Commission, BEREC or CEPT according to relevant areas of expertise.

2.3. D2D-MES services

Regarding D2D-MES no major hindrances have been identified by the RSPG. For D2D-MES there is a well-functioning framework in place supported by the CEPT voluntary harmonisation largely implemented in Member States. A limited number of satellites operators provide global services, including in the European Union, in a limited number of frequency bands.

The rules to access national markets differ between Member States. In many Member States, a registration/general authorisation scheme is applied while in other Member States, it is necessary to obtain individual authorisations. It may differ between frequency bands in Member States.

In its Opinion on 2 GHz MSS, the RSPG considered D2D-MES services in the 2 GHz MSS and recommended scenarios for the future use of this band after 2027.

Terminals for D2D-MES use are mostly licence exempt and, in some cases, licensed. Earth stations are generally licensed.

Various types of terminals and chipsets are available and RED applies.

Issues identified in developing this Opinion include:

- Spectrum:
    - Mechanism to address and solve interference, technical studies to address sharing and compatibility may be necessary, given relatively high-power flux density levels from D2D-MES in the space-to-Earth direction
    - Improvement of MSS receiver operating in L-band in order to reduce constraint to supplemental downlink (SDL) operating in ECS harmonised band.
- Service provision: emergency communication, roaming, interoperability

[7] See Article 18 of the Directive 2018/1972 (EECC)

- Competition: potential issues due proprietary technical solutions, access to scarce resource in a competitive satellite environment (such as in L-band)
- Licensing: licensing scheme to be established in the long term
- Security: lawful intercept, sovereignty, national security, privacy.

The RSPG has considered the relevant strategic spectrum issues and developed recommendations as appropriate in section 4.

Issues beyond this Opinion could be considered as appropriate by the EU Member States, the European Commission, BEREC or CEPT according to relevant areas of expertise.

2.4. D2D-IoT services in SRD bands

SRD usage is fully harmonised in Europe through the SRD Decision[8] and used by more than a billion devices under a general authorisation regime. Such bands worth noting are the 169 MHz and the 862-870 MHz bands. The RPSG notes that the CEPT is engaged in an analysis[9] of satellite use in the band 862-870 MHz to communicate with terrestrial SRD and that the relevant frequency use differs from D2D-IMT or D2D-MES cases.
Mixed views have been expressed by Member States regarding D2D-IoT in SRD bands. The introduction of D2D-IoT in SRD bands is not allowed in some Member States due to lack of designation in the national frequency plans and the lack of harmonised technical conditions. In other Member States such services can be introduced as long as the uplink technical parameters follow the conditions set out in the SRD Decision.

Issues identified in developing this Opinion include:

- Spectrum:
    - Harmonised technical conditions for uplink (already established), potential technical conditions for downlink to be established at EU level
    - Update the SRD Decision, potential change needed to support innovation
    - Mandate to the CEPT (under the existing Permanent SRD mandate)
    - Monitoring compliance with the harmonised technical conditions.
- Licensing:
    - How to make it possible in some Member States where satellite communication is not possible in the SRD bands
    - General authorisation, role of ITU-R RR Art 4.4, harmonised technical conditions
    - Establishing a list of SRD satellite operators sharing the harmonised spectrum (those complying with the harmonised technical conditions).

The RSPG has considered the relevant strategic spectrum issues and developed recommendations as appropriate in section 4.

Issues beyond this Opinion could be considered as appropriate by the EU Member States, the European Commission, BEREC or CEPT according to relevant areas of expertise.

[8] Decision 2006/771/EC (as amended)
[9] ECC report 357

2.5. D2D-IoT services in MSS bands <1GHz

The findings are very similar to those for D2D-MES. Member States use mostly general authorisation, just in some cases individual licences. Generally, Member States largely support a voluntary CEPT harmonisation under ERC Dec (99) 05 and 06 including voluntary harmonised technical conditions and list of systems to be considered for introduction in CEPT countries (which are compatible with other services and between themselves). Terminals are mostly licence exempt on a non-interference, non-protection shared basis.

Issues identified in developing this Opinion include:

- Mechanism to address and solve potential interferences issues
- Any need to increase harmonisation including at the EU level.

The RSPG has considered the relevant strategic spectrum issues and developed recommendations as appropriate in section 4.

3. Access to national and EU markets

The satellite sector is subject to intensive investment, growth, innovation and industry and service competition, including between regions. There are examples of non-EU countries regulating access to their market for electronic communications satellite networks ("landing rights" or other measures). Some of these regulations aim to ensure compliance with certain rules having an international dimension. For example, several countries (including the USA, Canada, Australia and Indonesia) have national rules relating to the ITU coordination status or to the interference situation with respect to national filings or affecting the ITU priority rules.

Member States are currently facing new challenges in authorisation of electronic communications satellite services. In that light, the RSPG has identified a need for a safeguarding mechanism on the basis of national authorisations to enable Member States to react collectively in the benefit of EU interests.

Below, the RPSG considers the need for "common requirements", possible mechanisms to react collectively, and a process for the case of non-compliance to such requirements. Examples of tools to enforce them as appropriate are the safeguard procedure of the RED, Article 28 of the EECC (Good Offices) and the 2 GHz MSS process (Commission Decision 2011/667/EC).

3.1. National Market Access

In compliance with the EECC, various approaches are implemented in national authorisations. This ranges from notification or registration of a satellite operator as a provider (without reference to the spectrum bands used for the provision of satellite services) to individual authorisations.

For Member States where individual authorisations are issued, different durations are implemented, ranging from 5 years to 20 years, depending on the type of application. Member States normally licence ground stations for 5 to 10 years.

Issues identified in developing this Opinion include:

- Drafting a long-term vision for individual national authorisations for electronic communications satellites services, addressing market access.

The RSPG has considered the relevant strategic spectrum issues and developed recommendations as appropriate in section 4.

3.2. Possible establishment of common requirements

Possible establishment of common requirements on electronic communications satellites services, as basis of possible safeguarding mechanism(s) to enable Member States to react collectively in case of non-compliance, has been discussed.

Possible benefits of introducing common requirements could be:

- Preventing operators from practicing regulatory forum shopping
- Equal treatment of satellite operators in entering the EU market to ensure that any conditions applying to EU operators would apply equally to non-EU satellite operators
- Protection of Member States' satellite and terrestrial networks and EU satellite networks
- Level the playing field of electronic communications satellite constellations and protect European interests and innovation.

Possible disadvantages of introducing common requirements could be:

- Potential changes in national telecommunication regulatory frameworks
- Challenges depending on the type of common requirements
- Risk of additional administrative burden for operators and Member States

Possible common requirements could include:

- Compliance of satellite networks with the ITU-R RR including
    - Application of relevant ITU-R RR coordination and notification (ITU Master International Frequency Register (MIFR) entry) procedures respecting ITU status/dates of protection and carried out in good faith
    - Compliance with relevant coordination agreements
    - No harmful interference to other satellite networks/systems nor to any stations operated in accordance with ITU-R RR
    - Non-interference non-protection basis (NINP) when the filing has not yet been notified and recorded in the MIFR or is operated under ITU-R RR No.4.4.

Issues identified in developing this Opinion include:

- Establishing common requirements on electronic communications satellites services
- Identifying a legal instrument to enhance compliance with such common requirements, including
    - potential new or amended provisions in EECC

- timing to implement a long-term vision for Member States electronic communications satellite authorisations with common requirements.

The RSPG has considered the relevant strategic spectrum issues and developed recommendations as appropriate in section 4.

3.3. Reaction of Member States in cases of non-compliance with common requirements

When a non-compliance to common requirements of satellite electronic communications service is not resolved at national level, the RSPG has identified a need for a mechanism for collective action on the EU level through the RSPG. Examples are the RSPG 'Good Offices' or a new RSPG 'Satellite group'. The task would be to identify the source of the issues, the need to react collectively fast enough and, if needed, how to react collectively including, if needed, a possible role for the European Commission.

A range of possible actions has been suggested depending on the issues to be addressed collectively, from a request by Member States for assistance from the European Commission (policy level) to a request for action to Member States (e.g. penalties, revocation of licence). In consequence, such collective reactions could range from the organisation of technical roundtables with participation from all Member States in order to analyse and resolve the issue, to sending a simple communication signed by all Member States with a request to resolve the issue, to the withdrawal of national authorisations. Some flexibility is needed to address various possible cases of non-compliance and application of the proportionality principle.

Relevant mechanisms should be based on consensus to be established in a given case, with regard to a proportionate collective action (in particular when only a minority is suffering from the interference or non-compliance). Further, the way to enhance or enforce compliance with the common requirements based on proportionality principles should be implemented at national level.

Some Member States are engaged in a common satellite monitoring tool enabling collection of data on satellite spectrum usage. This concept might be extended to provide a basis for mutual assessment or confirmation of an interference or non-compliance situation.

Various existing mechanisms have been listed as examples:

- Similar to the one of the Commission Decision 2011/667/EC
- Article 28 of the EECC (good offices)
- Modifying the EU Directive 2018/1972 (European Electronic Communications Code)
- Safeguard procedure resembling the Radio Equipment Directive (RED)
- Any other relevant EU regulations to ensure a common understanding of this procedure.

Issues identified in developing this Opinion include:

- The place where a non-compliance to common requirements could be collectively addressed

- The range of possible collective actions, mechanisms to handle non-compliance and how compliance could be enhanced or even enforced
- The necessary basis, on national level e.g. the inclusion/reference to the common requirements and tool(s)/mechanism(s)/instrument(s) in national authorisation(s)
- The mechanism(s) to enhance or enforce the compliance with common requirements.

The RSPG has considered how to react to "non-compliance with common requirements" for the benefit of EU interests and Single Market and developed recommendations as appropriate in section 4.

4. The Opinion of the RSPG

The Opinion of the RSPG in regard to the EU-level policy approach to satellite Direct-to-Device connectivity and related Single Market issues is described in this section.

4.1. D2D-IMT services

Globally, some satellite systems are already in operation communicating with existing mobile terminals. A large enough single market area with harmonised technical conditions enables incentives for D2D services to be provided in the EU upon market demand. Delays in harmonisation of technical conditions applicable to D2D satellites operating in ECS bands could introduce the risk of fragmentation of approaches in the EU and a risk of interference, with potential negative impact for consumers.

As a consequence, the RSPG recommends:

- The European Commission to issue a mandate to the CEPT under the Radio Spectrum Decision[10] to develop harmonised technical conditions for D2D-IMT satellite operations in ECS harmonised bands addressing, as appropriate, protection of ECS networks and other radio services from D2D satellite operations. Such mandate should include a follow up action further to the WRC-27 in order to update the technical conditions, if appropriate
- The European Commission to consider proposing an amendment to the current ECS harmonisation decisions under the Radio Spectrum Decision based on the CEPT response to the Mandate to enable the introduction of D2D-IMT under harmonised technical conditions.

Based on revised ECS harmonisation decisions and in order to protect ECS networks from D2D satellite operations in relevant ECS bands, Member States can under national legislation amend or vary ECS licences in order to enable D2D-IMT services if deemed relevant from a national perspective.

4.2. D2D-MES services

Regarding the implementation of proprietary technologies in terminal equipment, there is no need to engage on the EU level currently. There might over time emerge a need to review D2D-MES.

At this stage, the RSPG recommends:

- That Member States consider national spectrum licensing regimes/registries enabling better identification of satellite operators in each frequency band and to address specific market and technical issues/measures. This could benefit greatly from engaging in an exchange of practices (i.e. Peer Review forums, workshops)
- An improvement in receiver blocking in MES terminals operating in the L-band[11] in order to reduce constraints on mobile SDL operating in the ECS harmonised band.

4.3. D2D-IoT services in SRD bands

The RSPG recommends:

[10] Decision 676/2002/EC

[11] As recommended by CEPT (see ECC (17) 076 Annex 07 – June 2017)

- The European Commission to include, in its next guidance to the CEPT under the permanent SRD mandate, a request to recommend possible technical conditions for satellites which communicate with terrestrial SRD in relevant harmonised SRD bands
- The CEPT to maintain, on non-discriminatory and transparent basis, a list of satellite operators providing SRD satellite services in EU harmonised SRD bands, according to harmonised technical and operational conditions (i.e. satellite operators that are compatible with other services)
- Member States to develop authorisation regime(s) for SRDs communicating with satellites of the listed satellite operators in order to address relevant technical issues/measures, while considering if needed, any applications for public safety, security and defence used by national authorities (for instance in the band 862 – 870 MHz).

4.4. D2D-IoT services in MSS bands < 1GHz

The RSPG recommends:

- Member States to consider national spectrum licensing regimes/registries enabling better identification of satellite operators in each frequency band and to address specific market and technical issues/measures. This could benefit greatly from engaging in an exchange of practices (i.e. Peer Review forums, workshops).

4.5. WRC-27 follow-up

The RSPG recommends:

- RSPG to consider possible follow-up actions, including any need for European harmonisation, based on WRC-27 results on Agenda Items 1.12 (Low Data Rate MSS), 1.13 (D2D in IMT-bands) and 1.14 (additional MSS allocation) as appropriate.

4.6. Others issues

The RSPG underlines that Member States manage lawful intercept, national security on a sovereign national basis.

The RSPG underlines that issues beyond the responsibilities of the RSPG such as resilience, emergency communications, competition, privacy, and cybersecurity are managed in accordance with EU legislation by Member States.

4.7. Access to national markets (common requirements)

The RSPG has analysed and identified a possible scope of common requirements and investigated advantages and disadvantage of implementing such common requirements approach in national authorisation. The RSPG has concluded that such common requirements and the possibility for relevant collective actions (including relevant mechanisms to solve non-compliance), in the case that a breach of these requirements is not resolved at national level, are preferred over keeping the current status quo.

The RSPG recommends:

- The European Commission to consider proposing an update of the EU legal framework to allow for the implementation of common requirements in national

authorisation frameworks for providers of satellite electronic communications services including:

- Application of relevant ITU-R RR coordination and notification (ITU MIFR entry) procedures respecting ITU status/dates of protection and carried out in good faith
- Compliance with relevant coordination agreements
- No harmful interference to other satellite networks/systems nor to any stations operated in accordance with ITU-R RR
- Non-interference non-protection basis (NINP) when the filing has not yet been notified and recorded in the MIFR or is operated under ITU-R RR No.4.4.

4.8. Access to EU market (enforcement)

The RSPG recommends that a process be established in order to enable a collective response considering the proportionality principle to be implemented at the RSPG and at national levels.

The RSPG recommends:

- The European Commission to consider proposing an update of the EU legal framework with procedures for when a Member State identifies a non-compliance with common requirements if it is not resolved nationally. Such procedures should include reporting, assessment, collective reaction(s) (such as mechanisms to handle and resolve cases of non-compliance with common requirements) and an appropriate decision-making process
- The RSPG to play a role in these procedures in order to benefit from its expertise in ITU regulations and interference issues and from its capacity in recommending proportionate actions
- Member States should exchange best practices on national measures.

4.9. Radio equipment

RED is applicable and RED compliance is sufficient, i.e. no additional requirements are needed.

5. Further considerations

The RSPG intends to further investigate how to implement relevant recommendations when addressing the review of the EECC. When appropriate, the RSPG also intends to assess how to continue to engage in these topics.

When drafting this Opinion, the RSPG has identified issues beyond this Opinion which could be considered as and when appropriate by the EU Member States, the European Commission, BEREC, RSPG or CEPT according to relevant areas of expertise.