

6th of January 2022

Intelsat response to the RSPG Draft Work Programme for 2022 and beyond

Intelsat understands the role of the Radio Spectrum Policy Group (RSPG) to assist and advise the European Commission on radio spectrum policy issues. This includes advice on the coordination of policy approaches, on the preparation of multiannual radio spectrum policy programmes and, where appropriate, on harmonised conditions regarding the availability and efficient use of radio spectrum necessary for the establishment and functioning of the internal market.

Intelsat S.A, with headquarters in Luxembourg, operates the world's first globalised network, delivering high-quality, cost-effective video and broadband services anywhere in the world. Intelsat's globalised network combines the world's largest satellite backbone with terrestrial infrastructure, managed services and an open, interoperable architecture to enable customers to drive revenue and reach through a new generation of network services. Thousands of organisations serving billions of people worldwide rely on Intelsat to provide ubiquitous broadband connectivity, multi-format video broadcasting, secure satellite communications and seamless mobility services. The end result is an entirely new world, one that allows us to envision the impossible, connect without boundaries and transform the ways in which we live.

Intelsat would like to thank the RSPG for the opportunity to comment on their Draft Work Programme for 2022 and beyond. Intelsat acknowledges the importance of the Work Programme in paving the way of the future work in the RSPG. While recognizing the importance of all topics identified by the RSPG, Intelsat has decided to specifically address four of them identified as most relevant to our company and more widely to satellite industry, as detailed in the Attachment.

Sincerely yours,



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ATTACHMENT

1. WRC-23

Regarding **WRC-23 Agenda Item 1.2**, the interim opinion of the RSPG suggested that the “mid-band” range – which for Region 1 notably refers to the 6 425-7 125 MHz band – enables a good compromise between capacity and coverage and recognized a possible need for additional spectrum in the “mid-band” for future development of 5G. However, in accordance with statements from the Mobile Industry in the course of work in ITU-R WP 5D, there are no plans to use this band (or even the 3 600-3 800 MHz band) anywhere outside urban environments. Intelsat would like to note that WRC-19 already identified a tremendous amount of spectrum suitable for urban environments and questions the implications of identifying yet another frequency band for deployment of IMT in urban environments only.

People working from home during the COVID-19 pandemic, has led to increased need for reliable and more dispersed connectivity. This has shown how important it is to bridge the digital divide between rural and urban areas. Intelsat would therefore welcome from the RSPG a robust plan to look into alternative technologies and networks that can provide broadband connectivity on country-wide basis to ensure that people across all areas in EU member states have equal opportunities to be connected and work from home.

Intelsat would like to commend the RSPG for acknowledging that the protection of satellite uplink in the 6 425-7 125 MHz band is of international nature. Due to large footprints of satellite receivers, IMT use in the CEPT/EU countries could impact satellite reception in the entire Region 1. Technical studies conducted in CEPT regarding WAS/RLAN use in 5 925-6 425 MHz band have indicated that already a small amount of outdoor usage at European level could lead to exceedance of the protection criterion of satellite receivers. Consequently, technical conditions outlined in ECC Decision (20)01 pertaining to WAS/RLAN in 5 925-6 425 MHz band limit the use of low power devices to indoor only.

Intelsat requests the RSPG to consider conclusions from the studies performed in the past as well as the international nature of protection of satellite uplinks when developing the technical conditions for possible additional terrestrial use in the 6 425-7 125 MHz band.

Regarding **WRC-23 Agenda Item 1.3**, the interim opinion of the RSPG notes that the band 3 600-3 800 MHz is already allocated on a primary basis in Europe. Intelsat commends the RSPG for recognizing that in the context of this Agenda Item the protection and equal access of the incumbent radio services usage in Region 1 non-EU countries – which may diverge from the use in the European Union – will need to be considered in sharing and compatibility studies. Indeed, the technical basis for the EU framework in the band is that the satellite use in EU countries is represented by a limited number of relatively large and professionally installed earth stations at known locations. Especially in Africa where the deployment of terrestrial infrastructure is more limited, or if the geography and climate pose challenges, the reliance on satellite services – especially in c-band- is more profound and pervasive. Whereas EU framework is based on a case-by-case protection of a limited number of satellite earth station sites, there are thousands of professional earth stations for example in the African region. While protection of such earth stations in known locations could be feasible by applying separation distances, the number of

earth station sites to be protected would leave very little opportunity for widescale outdoor 5G deployment, such as the EU one.

Regarding coordination negotiations between EU and non-EU countries at the EU borders, Intelsat would like to note that even with primary Mobile Service allocation, non-EU countries have equal rights to ensure protection and future development of their services. Intelsat fully recognizes the need for the RSPG to protect the existing EU framework in this band but would caution the RSPG to give any recommendations beyond the extent that it threatens EU Member States to continue their current harmonised use in this frequency band.

Considering that the upgrade of Mobile Service has no direct impact to the existing European framework, and that the situation with regards to incumbent usage is very different between EU countries and rest of Region 1, Intelsat sees no justification for the RSPG to add pressure to other non-EU countries to adopt a framework that may not be the best suited or even feasible in these countries. Especially when such decisions will impact European based satellite operator's ability to provide C band services in non-EU countries.

Regarding **WRC-23 Agenda Item 1.15**, Intelsat commends the RSPG for recognising the role of space and satellite communications can play in improving connectivity for Europe's digital society and economy as well as the role of earth stations in motion in delivering broadband connectivity to European citizens including while they are travelling as outlined in the EC Communications on the Gigabit society and a 5G Action plan.

The flying and cruising passengers are increasingly expecting internet connectivity while travelling. In Europe, airline passengers expect to have access to internet connectivity during International and domestic flights. Therefore, earth stations on aircraft and maritime vessels have a variety of end users which will benefit from this additional Ku-band spectrum.

With regards to the usage of Copernicus satellites in the adjacent band, Intelsat would like to note that in accordance with inputs from ESA and EUMETSAT to CPG PT B¹ and ITU-R WP 4A², it is not expected that regulatory measures will be required to protect these satellites.

Similarly, regarding **WRC-23 Agenda item 1.16**, Intelsat commends the RSPG for acknowledging the role earth stations in motion in European electronic communication policy aims to deliver broadband connectivity to European citizens including while they are travelling as outlined in the EC Communications on the Gigabit society and a 5G Action plan. Intelsat is also pleased to note the support of European space policy on the development and production of non-geostationary satellites operating in these frequency bands.

Intelsat would like to see clear support from the RSPG for a positive outcome of WRC-23 Agenda Items 1.15 and 1.16, in accordance with goals set in the EC Communications on the Gigabit society and a 5G Action plan to deliver broadband connectivity to European citizens while they are travelling.

¹ Doc. PTB(21)060, available at https://cept.org/Documents/cpg-ptb/66142/doc-ptb-21-060_wrc-23-ai-115-impact-of-esim-in-1275-1325-ghz-on-eess-active-in-1325-1375-ghz

² Doc. 4A/469, available at <https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R19-WP4A-C-0469>

2. Digital decade 2030

Intelsat believes the era of fully independent terrestrial and satellite communications networks is most likely over. The key challenge is to ensure that satellite services is getting fully and seamlessly integrated with terrestrial infrastructure on 5G to best contribute to achieve the goals of the EU Digital Decade³.

Intelsat notes that the description of the work item is heavily concentrated on evolution of mobile networks and that RSPG considers spectrum harmonisation initiatives in support to 5G and 6G as part of this work item. In Europe, 5G in C-Band is only being used for additional capacity in urban areas. Intelsat would therefore like to ask what is the strategy of RSPG for extending coverage and reach of these Gigabit networks and how do other networks, such as satellite networks, fit into this strategy?

People working from home during the COVID-19 pandemic has emphasized the need for reliable and more dispersed connectivity. Satellite industry is continuously making efforts in defining the role of satellites in contributing to acceleration and extension of 5G networks, e.g. in 3GPP release 17 and beyond in release 18, 5G-PPP and NTN. Satellite networks play an important role in fostering the 5G service roll out in urban, suburban and unserved or underserved areas. They can also reinforce 5G service reliability by providing service continuity to users and reduce power consumption, by scaling 5G networks through the provision of efficient multicast/broadcast resources for data delivery towards the network edges, or directly to the user equipment. However, when discussing 5G from spectrum harmonisation perspective, these other networks are rarely acknowledged as part of the discussion.

At international level, the ITU-R adopted a report on the key elements for integration of satellite systems into Next Generation Access Technologies⁴. Additionally, there is ongoing work in the international standardisation body 3GPP in the form of two work items dedicated to ensuring satellite integration into the 5G ecosystem. Further information on the role of satellite in 5G can be found from the industry paper "Satellite Communication Services: An integral part of the 5G Ecosystem."⁵

Intelsat believes that to realise a viable 5G ecosystem and ubiquitous coverage, the integration of satellites into 5G networks at an early stage will be critical to make it seamless. As well as extending the reach of 5G terrestrial systems, satellite communications will be essential to an invisible and resilient overlay for terrestrial networks to help realise the vision for a 'Gigabit Society'; a society in which millions of connections between people, devices, and things will require inter-connectivity and stability at unprecedented levels that terrestrial networks alone cannot deliver. Therefore, Intelsat believes that spectrum harmonization measures for 5G or 6G should not automatically mean that the spectrum is auctioned for mobile network operators nor should such measures prejudice existing frequency users or impact current and future service offerings.

³ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12900-Europe-s-digital-decade-2030-digital-targets>

⁴ Report [ITU-R M.2460](#) "Key elements for integration of satellite systems into Next Generation Access Technologies"

⁵ <https://www.esoa.net/5g/>

Intelsat would like to encourage RSPG to continue acknowledging the potential and complementary nature of different technologies in a fair and balanced manner. While several ongoing activities within EU Member States, such as 5G roll-out and next generation WiFi in 6 GHz, are targeting to provide broadband access concentrated in urban areas, it is vital to continue supporting technologies that enable provision of these services in large scale across EU Member States. Only by safeguarding spectrum access to a full variety of existing technologies and networks, is it possible to ensure a versatile European network of networks and to minimize the digital divide in Europe.

3. The development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks

The RSPG states its intent to consider early signals of demand for additional spectrum as well as the necessity to make a certain amount of harmonised spectrum for 6G. The work item is considered as the possible basis for future 6G spectrum roadmaps of the RSPG later on. The RSPG mentions both spectrum bands targeted for 5G – including low and mid bands – as well as early exploratory work in the sub-THz bands.

Intelsat fully understands that the mobile industry has expressed great interest in displacing satellite users from the C-band spectrum within Europe. With terrestrial 5G and with the latest technological advancements in mobile technology for 6G, this interest in C-band has only intensified. However, the RSPG has to balance technical and economic factors related to the promises of 5G and future 6G, and the importance of existing services, including satellite services.

Intelsat therefore supports and agrees that spectrum for previous mobile generations, not only 5G but also that of legacy systems being phased out (2G, 3G, and 4G) should be considered for 6G. Considering the amount of already harmonised spectrum as well as the efficiency of these new technologies in comparison to the legacy ones, there should not be any need to look into new spectrum resources for this foreseen new mobile generation. For example RSPG should first encourage infrastructure investment and re-farming of existing mobile spectrum before auctioning additional spectrum. Intelsat is pragmatic of the need to make available additional mobile spectrum when and where there is a proper justification and need for it, however it should not be detrimental to existing services.

Intelsat would like to see a clear and concrete commitment from the RSPG not to jeopardize satellite use in the conventional C Band in order to “free up” spectrum for terrestrial 6G applications. Intelsat notes that the RSPG is planning to hold high-level workshops on this work item and would appreciate the opportunity to participate in such activity.

4. Role of Radio Spectrum Policy to help combat Climate Change

Satellite networks are vital during natural disasters and other emergencies, as they enable establishing rapid and reliable communications. Once launched, satellites are essentially carbon neutral as they rely on solar power. However, when spectrum availability for satellite networks is reduced, such as in C-band, additional satellites are needed to maintain the same capacity levels. Therefore, the most environmentally friendly option is to allow the launched satellites to utilize the frequency ranges of the designed payload to the extent possible for the entirety of their life span.

Mobile network operators often argue that introducing 5G will be effective in combating global warming including the fact that 5G equipment will be less power hungry than previous mobile generations. Undoubtedly the 5G transmitters are individually more power efficient, however a 5G base station would need have 8 to 16 times more transmitters and receivers than a 4G base station to cover the massive MIMO required, particularly given the poorer propagation achieved in C-band compared to lower frequency bands. Satellite networks are able reduce the power consumption of 5G networks, through multicast/broadcast of data towards the network edges, or directly to the user equipment.

Intelsat would like to see that as a part of helping combat Climate Change the RSPG will consider the sustainability of their recommendations as well as regulatory certainty and spectrum access in long term to networks throughout their entire life span. Intelsat notes that the RSPG is possibly planning stakeholder workshops on this work item and would appreciate the opportunity to participate in such activity.