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**COMMUNICATIONS ALLIANCE
SATELLITE SERVICES WORKING GROUP (SSWG)**

SUBMISSION

to the

Australian Communications and Media
Authority's (ACMA) Sharing between fixed
point-to-point links and uncoordinated earth
station receivers in 10.7–11.7 GHz

19 August 2019

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EXECUTIVE SUMMARY

The Communications Alliance Satellite Services Working Group (SSWG) welcomes the timely initiative by the ACMA in evaluating the technical feasibility of allowing uncoordinated earth station receivers in the 11 GHz (10.7 to 11.7 GHz) band, potentially by class-licensing arrangements.

Whilst recognising that the 11 GHz band is quite heavily used by point-to-point links, the SSWG is pleased to acknowledge and support the ACMA's preliminary view that it is technically feasible to develop with such arrangements, albeit with the proviso that no constraints should be placed on the future growth of fixed services in the band.

About Communications Alliance

Communications Alliance is the primary telecommunications industry body in Australia. Its membership is drawn from a wide cross-section of the communications industry, including carriers, carriage and internet service providers, content providers, equipment vendors, IT companies, consultants and business groups.

Its vision is to provide a unified voice for the telecommunications industry and to lead it into the next generation of converging networks, technologies and services. The prime mission of Communications Alliance is to promote the growth of the Australian communications industry and the protection of consumer interests by fostering the highest standards of business ethics and behaviour through industry self-governance. For more details about Communications Alliance, see <http://www.commsalliance.com.au>.

Introduction

The introduction of new satellite services and applications in Australia include high capacity throughput satellite systems, satellite-based data, entertainment and Internet services, low latency services approaching terrestrial characteristics, and earth stations in motion for broadband aeronautical, maritime and land mobile applications. These categories of satellite service enable immediate coverage of the service area once the satellite(s) is in place and at an increasingly economic cost. As well as bringing complementary solutions to terrestrial networks, satellite systems are often the only answer to bringing high quality broadband services to users in remote or otherwise unreachable places.

These broadband satellite developments and their terrestrial counterparts are generating unprecedented demand for the use of spectrum. This, in turn, calls for a re-assessment of how spectrum can be utilised more effectively and for the evaluation of traditional methods of spectrum allocation, assignment and sharing. In the past, the availability of adequate spectrum has provided the luxury of being able to allocate spectrum to a limited range of services, without the need to necessarily achieve optimal efficiency. In more recent years, the more diverse and complex demand scenario has imposed new pressures on regulators, industry players and the spectrum allocation framework in general.

Broadband developments and ubiquity of mobile services both lie at the need to accommodate new and innovative satellite services. Understanding the challenges of constellations (which are already being launched) brings a further complication to the regulatory framework, with often many thousands of NGSO satellites proposed in those low and medium earth orbit satellite systems. Gateways in Australia providing the feeder links for constellations must cope with a greatly expanded number of satellites, often well outside the national footprint, whilst service links are more directly related to those satellites creating the national footprint. This in itself causes different considerations for non-geostationary orbit (NGSO) versus the more traditional geostationary orbit (GSO) satellite networks, which have to date been the basis for regulatory licensing procedures. It is imperative that Australia maintains a regulatory approach in line with global networking. It is no longer appropriate to believe that Australia can act on a national basis and in geographic isolation, because of constellations that reach into other parts of the region from Gateways in Australia. Thus, regulatory decisions in Australia with regards to constellations will be exported to other countries through the operational nature of these systems. Likewise, the frequency bands of constellations used in Australia should allow for the frequency range capability adopted by other regions in order for Australia to fully benefit from the new technologies. Further, it is worth noting that service bands and gateway bands can be quite disparate, e.g. Ku-band and Ka-band respectively.

Whilst the focus of this submission is on 10.7 to 11.7 GHz, there would also be other bands where a progressive assessment might be required as the demand for satellite services increases. This would include the band above 12.75 GHz for example, and developments in Europe are instructive here.

Discussion

Earth Stations in Motion (ESIM) represent a particular application of service based on fixed satellite service (FSS) allocations and using terminals which operate 'within the envelope' of the FSS. In general, ESIM terminals within both the GSO and NGSO environments are intended to be made available on a ubiquitous basis on a non-interference/non-protection assumption. However, in the case of ESIM terminals used in a fixed location and needing a guarantee where any risk needs to be eliminated in the present and future it is at the discretion of the operator to seek protection through an individual apparatus licence and

the associated coordination process, given that the FSS still has primary status in the 11 GHz band. This invokes spectrum denial for which the user must pay a premium.

To operate ESIM in a nomadic or mobile sense, operation in a non-constrained way would be untenable, given the primary status of the fixed service (FS) and the existence of many FS links in the 11 GHz band. Therefore, we believe that the operation of ESIM under a non-protected assumption makes the most sense and will not impose undue constraints on the FS. This also brings in additional use of the same spectrum and a more efficient implementation of spectrum usage.

The licensing conditions under which NGSO constellations need to operate should be directed towards limiting risk to the FS and may need to be tailored to the individual constellation, with discretion available to the regulator. For instance, minimum elevation angles may need to be specific to any particular constellation. This is particularly true of gateway installations which need to operate down to low elevation angles, but less so for user links where the elevation angles can be assumed to be much higher. The elevation angle limit is a product of radiated power and angular separation. Other conditions may be imposed in the licensing such as channel switching. These matters come up later.

The SSWG agrees with the timing of the ACMA's response to submissions (by the December 2019 Quarter), given that NGSO satellite constellation launches have already begun and service testing is impending, ahead of full service implementation. Clearly the confidence by which implementation is going ahead underpins industry's view that ACMA's preliminary view is correct in it being technically feasible to develop class-licensing arrangements to enable the non-protected use of uncoordinated earth station receiver usage in the 11 GHz band.

This feasibility is also a feature of the considerations by the Federal Communications Commission (FCC) and the European Commission (EC). As well as less populated areas, NGSO systems are likely to be adaptable to high population density areas, using various techniques. The technical basis for acceptance should be augmented into existing Radiocommunications Assignment and Licensing Instruction (RALI) procedures for ESIM providing service links. The operation of gateways needs also to be included into RALI procedures, recognising the broader implications of gateway operations and unique designs of different constellations. The SSWG believes that there should be zero tax on ubiquitous deployment of ESIM service links (but a fee for ACMA services in setting up the Space class licence). For gateways, these are likely to require spectrum denial and the usual taxes as a result – though in themselves the SSWG separately contends that Ku-band taxing is too high and overdue for review.

Current national arrangements

The SSWG is grateful to the ACMA for providing very useful summary information on the 11 GHz band, pointing out the current usage for fixed point-to-point and FSS earth receive stations and the current licensing approaches, which depend on individual apparatus licensing.

Clearly the advent of ESIM causes a need to evaluate changes required and in a regulatory sense once technical feasibility is established, changes such as a Footnote to the Australian Radiofrequency Spectrum Plan (ARSP), as well as other regulatory instruments and amendments to RALI procedures would clearly be in order, and the SSWG understands the ACMA observations here.

Planning and implementation issues

The SSWG agrees that maximising the public benefit can be increased by extending shared access to spectrum, and ESIM offers that opportunity. The SSWG is encouraged to learn that the ACMA has formed the view that uncoordinated earth stations could be supported in the 11 GHz band.

The SSWG accepts the fact that where the satellite industry accepts the circumstances of a non-protected basis of operation then there is an associated risk. However, for many rural and remote applications – for instance - that risk is not expected to be high compared with the benefits or rewards from innovative services being delivered to those areas. Where the risk is too high, after mitigation measures have been considered, the fallback for fixed locations is a coordination approach.

The SSWG notes that the ACMA has been looking at various mitigation measures which may lead to more optimistic results than what has been provided in the Discussion Paper. The modest probability of interference into uncoordinated earth stations in today's environment comes with some pessimism in the ACMA assumptions, for instance in not accounting for clutter and other shielding effects, plus other mitigation measures available.

Issues for comment

The following responses are to the itemised questions posed in the ACMA in the Discussion Paper.

Question 1

Will the future of the 11 GHz band by the fixed service be impacted if arrangements are developed to facilitate the use of uncoordinated earth station receivers in the band?

The SSWG agrees with the feasibility of uncoordinated operation as pointed out by the ACMA and the associated conditions which will protect and avoid compromising the future of 11 GHz for point-to-point services. Put another way, Question 1 seeks a guarantee for fixed services, and the answer is an unconditional 'yes'. To seek any further concessions would be unlikely to be tenable.

Need for technical restrictions and operational conditions on uncoordinated earth receiver stations

Mitigation measures anticipated by the ACMA include the ability to use an alternative channel with the band or in a different band, avoiding operation at low elevation angles, and/or minimum antenna diameter requirements.

These are measures which are reasonable in their principle, but where details are best left to prospective licensees to bring to account in negotiating the licence process. This is a consequence of technology and different constellation designs which are not traditional in nature. For instance, different elevation angles for different constellations may be regarded as reasonable or sufficient, and antennas are fast developing and likely to be planar and electronic arrays – again because of the nature of constellation operation. One size will not fit all when scoping the design parameters to be included in the licensing.

The SSWG agrees that gateway antenna systems are likely to be individually licensed and coordinated. Their importance is enhanced by the fact that they will interact with many more satellites than are occupied in providing national service links and therefore they are of significance for feeder links to many more adjacent markets.

Questions 2 and 3

Is it technically feasible for uncoordinated earth station receiver to operate in the interference environment that exists in the 11 GHz band?

Is there a need for technical requirements or conditions on the operation of uncoordinated earth station receivers?

Given the above comments, the answer to both questions is 'yes', but qualified in that the technical requirements are likely to be tailored to the different constellations coming forward. To achieve a fair and equivalent outcome, one size will not fit all and would be

counterproductive to efficient spectrum usage and full functionality of the individual constellations involved.

Question 4

What, if any, are the implementation issues for licensing options, pricing and updates to licence assessment procedures ?

Licensing

The SSWG agrees that uncoordinated earth station receivers should be supported by the Communications with Space Objects Class Licence, combined with a space apparatus licence, by amending the class licence to include the 11 GHz band as an authorised frequency range for reception.

Technical restrictions and conditions can be included in the Class Licence with sufficient scope for the ACMA to exercise due discretion in accordance with different constellation designs.

This does not necessarily represent the views of Telstra, which is presenting its views in its own submission.

Pricing

Spectrum denial is at the heart of spectrum pricing and is partly used as a tool to control demand and partly as a revenue raiser for use of a public good.

Given that ESIM and pricing for uncoordinated services are new issues to the 11 GHz band it becomes quite urgent to align the timing of pricing considerations and licensing/technical considerations, given that service is not far away.

Considering that ESIM would be authorised on a class licensed basis, the common acceptance with a Class Licence is that no tax is relevant, and a service fee for administration by the ACMA would be quite proper and acceptable as a charge associated with the umbrella Space Apparatus licence.

Licence assessment procedures

The SSWG recognises the ACMA's observation concerning the need to update the Communications with Space Objects Class Licence and the need to consult on any update requirements of the ACMA's procedures for submissions regarding space apparatus licences.

The scope of updates provided by the ACMA seems comprehensive and appropriate at this stage, and the SSWG would like to give further consideration to these as and when the ACMA provides for consultation on licensing processes.



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