

SUMMARY REPORT

REGULATOR TO REGULATOR DIALOGUE ON APPROACHES TO LICENSING OF LARGE CONSTELLATIONS FOCUSING ON INTER-INSTITUTIONAL DYNAMICS AND REINFORCED SYNERGIES

14 February 2023

Vienna, Austria

On February 14, 2023, Secure World Foundation, and the European Space Policy institute convened a regulator-to-regulator dialogue on approaches to the licensing of large constellations, with a specific emphasis on the possible role of orbital carrying capacity or thresholds. Given the concurrently unfolding session of the UN COPUOS Scientific and Technical Subcommittee, taking place between the 6th and the 17th of February 2023, this Third Edition of the dialogue focused on interinstitutional dynamics and reinforced synergies between existing national and international structures.

Large non-geostationary orbit (NGSO) constellations pose a number of unique challenges for regulatory processes that are primarily designed to administer spectrum access, coordination, and interference matters. This Dialogue brought together space and spectrum regulators from multiple countries and international organisations, to discuss each of these challenges and existing and potential future inter-institutional dynamics, with a case focus on the topic of orbital carrying capacity. The Dialogue was held under the Chatham House rule and was hosted at the offices of the European Space Policy Institute in Vienna. This report briefly summarises the themes and major discussion points of this Dialogue.

Introduction & Context

The meeting started off with a round table of introductions by all participants, followed by a number of presentations focusing on (i) summarizing discussions and outcomes of the first two regulator to regulator dialogues in the series, (ii) policy and regulatory implications of capacity-based concepts for the space environment, and (iii) technical presentations of the undertaken work in capacity based approaches to the space environment and the underlying drivers.

It was noted that the current environment is one in which administrations are seeing a large increase in the level of satellite spectrum access filing activity, while satellite launch rates are also at a historic high and likely to further grow. In this context the capacity-based concepts were presented as a potential approach to defining, measuring and then managing access to, and use of Earth orbits.

From hereon the event took the form of a moderated discussion with all participants invited to contribute their views across three themes briefly described below.

The interplay of capacity approaches & first-come-first-served dynamics

A common theme in the discussions was the idea that any approach to space capacity management should be evaluated against the first-come-first-served dynamic, with participants suggesting that safeguards should be put in place to ensure that sufficient capacity if agreed upon, would not be free to consume by those coming first. It was clarified that capacity definition and management are notably about mitigating this dynamic and enabling the design of equitable frameworks for access to orbits. One participant noted, that while calculating and monitoring what

is out there can be considered neutral, what will be might more difficult is to agree on what to do about the observed evolution. It was noted that the proactive formation of equitable frameworks is significantly more difficult than even the measurement of existing and future capacity, as it requires normative decisions and international cooperation.

Moreover, participants noted that the first-come-first-served approach has a much bigger impact on physical congestion compared to spectrum where the effects are short-term, as opposed to over-congestion and its potential consequences, the nature of which is long-term by design.

Facilitating exchange between space and spectrum regulators

The parallels and intertwined dynamics between effective management of the electromagnetic spectrum and the physical capacity of the space environment were brought up in several remarks. In this context, the level of exchange between space and spectrum entities was explored, with participants noting that different models exist at national level. In a few cases space and spectrum regulators are required to work together during licensing processes, in others, they sit far apart and have limited contact, while in some the level of cooperation fluctuates, and is defined by the organizational realities of national administrations. Moreover, in some countries, responsibilities for both space & spectrum licensing are given to actors with otherwise limited overall exposure to space. Generally, participants noted that a **need for effective collaboration between different regulators is clear**, as the activities of one institution have a direct and profound impact on the other. Whole-of-government approaches to various licensing procedures with an impact on the space environment were considered as a relevant model in the way ahead.

It was also suggested that, in addition to coordinating with their own national telecommunications regulators, national space agencies & space regulators could be provided with an active role in meetings of the International Telecommunications Union.

In this context, several participants noted and agreed that spectrum management is very different, - spectrum use is easier to measure and manage as it is an operational constant, while the physical dimension of NGSO operations is defined by a number of parameters with orbital altitude and inclination just two relevant parameters. Moreover, interference in spectrum is easy to observe and remedy, while physical interference increases the risk for all objects sharing the same operational environment.

Moreover, a participant emphasised the fact that spectrum management cannot be seen as directly analogous to space object management, as there are already concrete frameworks for it with more potential options for remediating violations and existing regulatory experience. There is also a significant terrestrial component to the spectrum management system, which is not directly analogous to the challenges of space object management. At this junction some participants suggest the space environment modelling community, as well as space object regulators, should increase analysis of the coordination mechanisms used in other domains to manage capacity.

Impact of large constellations on the work of UN COPUOS STSC

Several participants highlighted the importance of both intra- and inter-national cooperation on physical congestion and capacity-related discussions, with one participant noting that we "can't avoid talking about it anymore".

Several participants discussed how the definition of a large constellation varies across different jurisdictions and institutional interpretations, with the constellation threshold being set anywhere between 2 – 20. The complexity is further accentuated when discussing large constellations, as

defining a number seems to be a moving target given the plans of announced future constellations. In this context, one participant noted that ultimately while the absolute number is relevant, it is the risk profile of a mission that determines the risk of an object/constellation for the space environment.

Finally, exploring pathways towards exploiting lessons and results stemming from orbital capacity research, notably in Low Earth Orbit, and employing them in the future work of the new working group on long-term sustainability of outer space activities (LTS 2.0) was highlighted.

Next Steps for Regulator to Regulator Dialogues

Moreover, interest in facilitating exchange between UN COPUOS and ITU stakeholders (and space and spectrum regulators, more broadly) was explored, with participants confirming the need and interest to continue creating informal opportunities for exchange. In this context, the organizers consider closer engagement with spectrum regulators a key 2023 priority.